

# Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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## Wanted, Specific Data on Electric Locomotives

HASN'T there been enough general discussion on certain features of heavy electrification? Most engineers agree that electrification generally will decrease the operating ratio by increasing the traffic and by saving coal, but that each problem is a case for special study as to the ultimate saving involved and the system of electrification to be chosen. All the foreign commissions have ended their study of American systems and installations by saying "it depends on the specific application."

Why should there not be some more definite discussion on the electric locomotive? Shall the motors be built on the axles, should direct gearing or quill drive be used, should connecting or coupling rods be employed for transmission, and how does freight or passenger service affect these decisions? What is the best method to lubricate the motor, and where should the motor be placed so that it can be inspected and repaired with the greatest ease? What kind of control should be used and where should it be located? What real basis for rating the motors can be devised?

On matters of this sort there seem to be plenty of opinions of a diverse character, but a great dearth of reliable data collected from service operations. There have been enough installations of various kinds to accord data which would fix some features of design and enable railway men to have some definite knowledge in regard to heavy electrification equipment. Topics along this line could well be selected for some of the coming association or club meetings on heavy electric traction rather than the general economies of the subject.

## How About a Cushion?

THE use of equipment until it falls to pieces, the deferred maintenance on tracks, the worn crossings and high rates of acceleration and braking have developed the fact that the failure of many car parts is due to fatigue and to metal crystallization caused by shock loads.

A bad track necessarily increases the stresses on a car by causing the frame to sway, by at times raising diagonally opposite wheels and by throwing parts out of line on curves. It also injures and fatigues the metal in the axles, breaks bearings and causes intangible deterioration to the car, since the springs have a limited range of operation and serve only to relieve the shocks and strains on certain parts.

Another result of these conditions is the effect on service quality. Every passenger appreciates a car that does not jump or jar because of bad tracks. Every railway manager realizes the effect of bad tracks on schedules and power consumption and desires more riders to patronize his system. What are the remedies?

There are two which come to mind. One of these is to put the tracks and special trackwork in good

shape. Money is not plentiful but enough should be found to purchase a grinder and repair tools and to pay repair gangs, even if some other things are neglected. The second remedy may be to make some change in car designs in the way of more cushions on the car parts. Educated to some extent by the rubber-tired vehicles with their easy riding qualities, people today are more particular about this point than they were. They like easy riding street cars as well as automobiles. This is a matter which can well be considered by car designers. Aside from the advantages derived in gaining public favor and thereby increasing patronage, there will also be quite tangible results in reduced maintenance costs.

## How Can Mass Transport Remain a Monopoly?

THE disconcerting ease with which any desired kind of automotive service can be established by companies or individuals is something that threatens absolutely to imperil the permanence and the growth of the cheaper and basic forms of transport on rails which still remain necessary for the heavier work in moving the public. An unkempt, irresponsible example in the United States and Canada has been the jitney. In Great Britain a new antagonist, in addition to existing bus companies, has put in an appearance during this year through the falling away of certain war-time restrictions. Any one who now desires to establish a motor-bus service can do so upon payment of the national license fees for public utility vehicles without depending upon the consent of the local authorities. Thus, in any city where the community itself may not have secured the right to run buses, it will be possible for others to do so when, where and how they please.

Truly, this is an absurd situation, for in all the generations since the establishment of transportation franchises those who served as public carriers have had certain, definite responsibilities. But the development of the automotive vehicle has been so amazingly swift that the law is still a long way from dealing with it in a way that will protect those who have invested most in giving the public what might be called the "substantial" transportation service. This is indicated also by the fact that Parliament has just refused steam railroads the blanket right to run auxiliary or co-ordinating bus services, while making this grant freely to all others except municipalities. The reason for this invidious exception of the railroads has been attributed to a deliberate effort to stimulate wasteful competition instead of promoting co-operation on the part of many elements of the public—especially the commercial classes who ought to know that in the long run all waste must be paid for.

The present conditions in Great Britain offer a clear warning to both the electric and steam railways on this side that they had better hurry to get all the motor-bus rights possible if they want to avoid possible like

treatment of them in the early future. Something more constructive than anti-jitney ordinances is needed if all the mass transportation in a district is to be kept under the direction of the organization with the greatest resources and experience and of proved reliability. That organization is the electric railway.

### Much to Be Learned on Both Sides

**D**URING the past six months visitors to America have included railway managers and engineers from a number of countries abroad, seeking light on various traction problems. This fact should not beguile Americans into a belief that their practice is perfect or even better in all respects than that across the Atlantic. In one particular it is true America leads the world. It has more miles of track electrically equipped than any other country, and for this reason this country may be ahead in many technical features as regards transportation over rails. There is a much larger field here than in any single country abroad for a device which promises a saving in operating expenses, so it is not surprising that inventors and good inventions abound. It is not that European managers are behind their American colleagues in appreciation of technical advances but there is not the same opportunity for their development.

On the other hand, an obligation to depend on one's own resources has often been the means of developing an acute sense for utilizing the means at one's disposal, and it is probably true that American visitors to foreign shores would find as much in electric railway lines to instruct them as will be found here by those who come here from Europe and South America. This is particularly true in the commercial aspects of the business as well as in the co-ordination of various means of transit, such as bus and trolley. Where traffic is scant, prospective passengers have to be urged to take the cars, and this has made the art of merchandising transportation, with all that that expression implies, one worth cultivating, and American managers could do worse than to adopt some of the best traffic stimulators used abroad. To paraphrase the famous saying of Sir Roger de Coverley, "There is much to be learned (said) on both sides."

### Limited Financing Can Be Done

**A** GOOD EXAMPLE of how an electric railway company may overcome the extreme difficulty of securing new money for capital expenditures is afforded in the accomplishment of the Gary Street Railway, related elsewhere in this issue. The officials met with that refusal from the usual financing agencies with which many railway executives are familiar, and they decided to see what could be done at home. Some badly needed reconstruction of important track on a street undergoing paving provided the necessity from which sprang new ideas. It was decided to try out the employees as a source of money, and the response was immediate and surprisingly generous. Having themselves a financial interest in the enterprise, the employees thereafter made ideal salesmen to peddle more of the same securities to the public, and they succeeded and incidentally earned a small commission on each bond sold.

The plan is particularly appropriate for the small

company where the employees can be closer to the management. But it has also been followed with reasonable success in some of the large utility companies. Not only does it accomplish the immediate need of the company for new money, but it gives the employees a new and far more tangible interest in the success of the company and furthermore extends the distribution of these securities among local residents, which is greatly to be desired. Railway companies, both large and small, may well indeed seriously examine this Gary experience. The indirect results of better employee and public relations may be of even greater importance than the direct result of securing capital.

When one sees successful financing on such basis as this, it seems reasonable to suggest that no railway company should be willing to say that it cannot finance any badly needed new work until it has tried and exhausted the possibilities of employee-customer financing. Of course, there must be the condition that the securities so offered are sound and the prospects of earning the promised interest or dividends good.

### Electrolysis— and Remedies

**E**LECTROLYSIS is to railway companies like inductive interference to power companies—it refuses to take a standardized treatment and causes constant irritation.

Local conditions make each cause of electrolysis worthy of special study. The effects of soil corrosion, soil constituents, system layout and equipment and climate conditions are so marked and the opinions of engineers differ so greatly as to the limits to be set for track to earth potentials, that each example of disease affords opportunity for a special clinic. Many years of experience in many localities, however, have afforded data and remedies. With these available it should be possible to cure each case after the correct diagnosis has been made.

There have been pro and con arguments on the "pipe drainage" system, the "insulated negative return" system, the "welded track" system, and there is the rather unique "three-wire" system used in Los Angeles, Winnipeg, Omaha, Milwaukee, and Wilmington. In some of these cities the three-wire system has been used to supplement or to supersede other systems. The data available do not prove it to be a cure-all for electrolysis but do prove that it greatly improves conditions if used with intelligence. It still appears that a well-bonded track or a welded rail track is the best general remedy, although soil conditions, light rails and heavily motored equipment, etc., may require the supplementary use of other systems.

Electrolysis is a fact that must be faced and the increased use of underground power and telephone cables, water and gas pipes, reinforced concrete and steel structures have increased the seriousness of its occurrence. In these days when track maintenance has been deferred by many railway properties, it would be a wise move to check up on track and electrolysis conditions and, if necessary, remove the causes before agitation by others affected stirs up a hornet's nest of public sentiment. The railways cannot afford to antagonize public sentiment by neglecting to remove causes for political or technical bludgeoning by outsiders. The fences must always be watched carefully in the railway industry.

## Three-Wire Railway Distribution in Wilmington

Improves Regulation and Prevents Electrolysis—Trial Proves System Best Adapted to Radial City Districts—Substation Equipment Must Be Flexible

BY A. P. WAY

The American Railways, Philadelphia

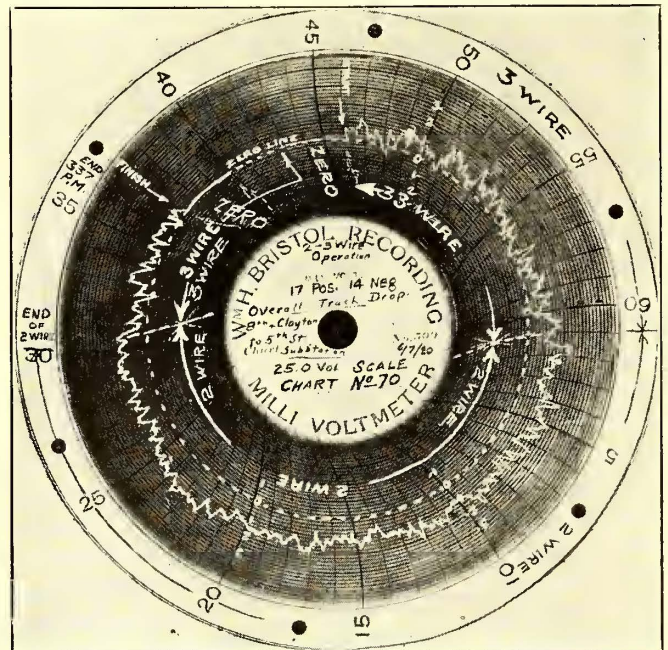
**D**URING 1915 there was a consolidation of electric railways in Wilmington, Del., and one large economy was accomplished by shutting down a steam generating plant in the southwest section of the town in order to carry the entire railway load from a larger plant in the northeast section nearer the load center. This necessitated the use of motor-driven boosters to deliver satisfactory operating voltage to two long suburban lines; also the distance of feeding some other divisions was materially increased. No provision had been made to take care of the additional return current into the plant, which was supplying a normal combined load of about 3,000 amp. with short-period peak loads of 4,000 to 4,500 amp. To make matters worse in regard to this return current, the Brandywine Creek was located between the plant and about 90 per cent of the load with only two single tracks on bridges and insufficient copper to supplement the rails.

When both plants were operating there were neutralizing potentials in the territory between them, making a resulting small track drop between stations with a corresponding small tendency for stray current, but when all current flowed in one direction the track drop was proportional to the sum rather than the difference of the currents.

It did not take long for the gas, water and telephone interests to find that their underground structures were in danger and they promptly notified the railway company. In that this difficult problem was worked out in close co-operation by engineers of all utilities interested, it is thought that a story as to how results were obtained and the difficulties encountered would be of interest to railway engineers.

A very brief study of the distribution and a few preliminary tests showed clearly the cause of trouble, and without making an elaborate survey quick remedies were applied to remove temporarily the stray current in the neighborhood of the power house before a more thorough study could be made for more permanent remedies. It was found that all the underground structures were carrying considerable current toward the power house and these showed a relatively large positive potential to earth and to rails near the plant with the exception of the lead-covered power cables which were liberally drained at the plant. Further, there was considerable potential difference between different underground structures showing that there was a tendency for an exchange of current between them. To change conditions new drainage cables were erected to points along telephone cables and gas and water pipes on the south side of the creek and the underground structures nearer the plant were further drained while drainage of power cables was not increased. These steps were taken to reduce potentials between underground structures and to reduce potentials to earth but still to favor lead-covered cables to some extent. Considerable rebonding and renewal of jumpers about special work were accomplished as promptly as the much-disturbed labor conditions in that large powder manufacturing district in war time would allow.

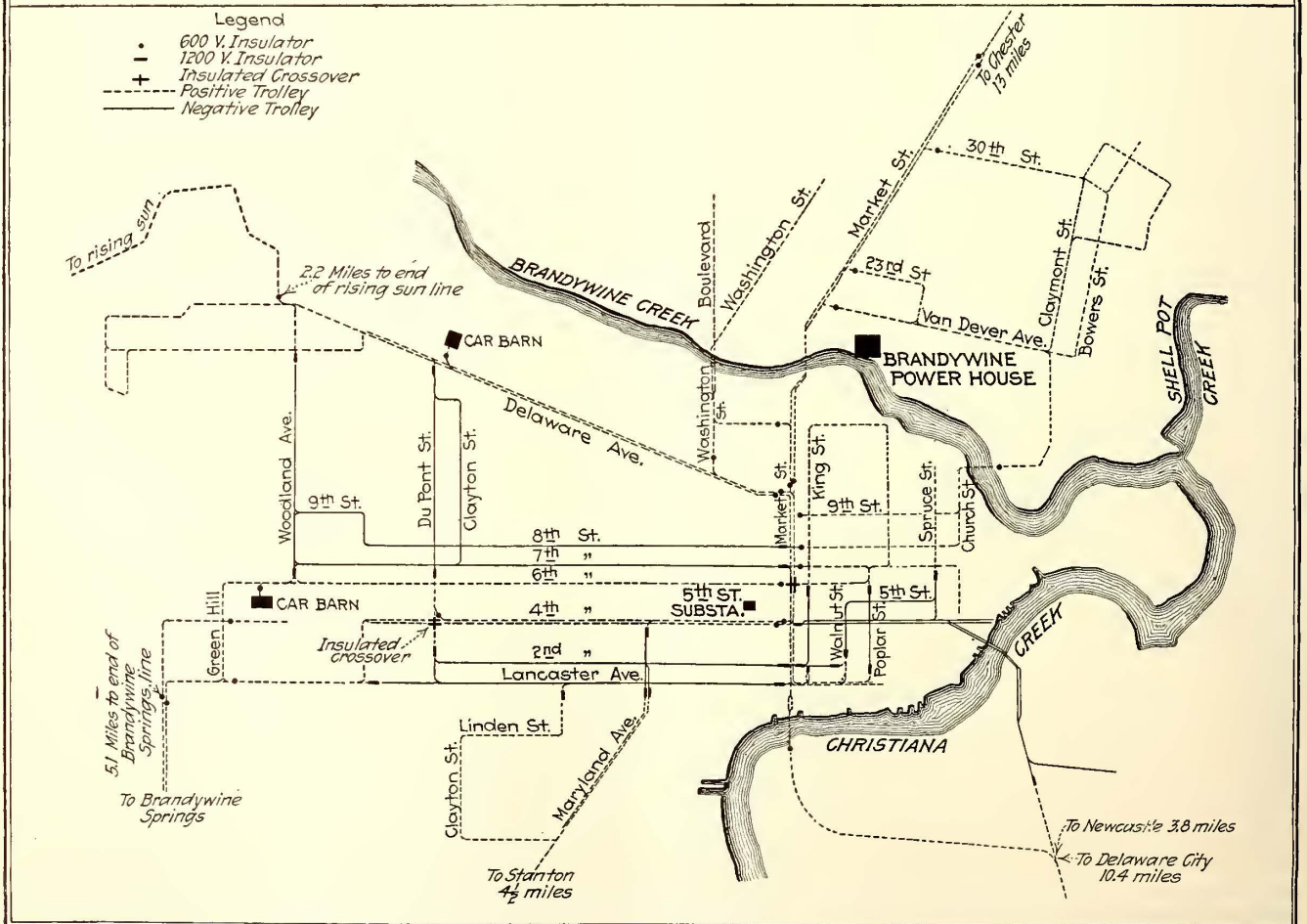
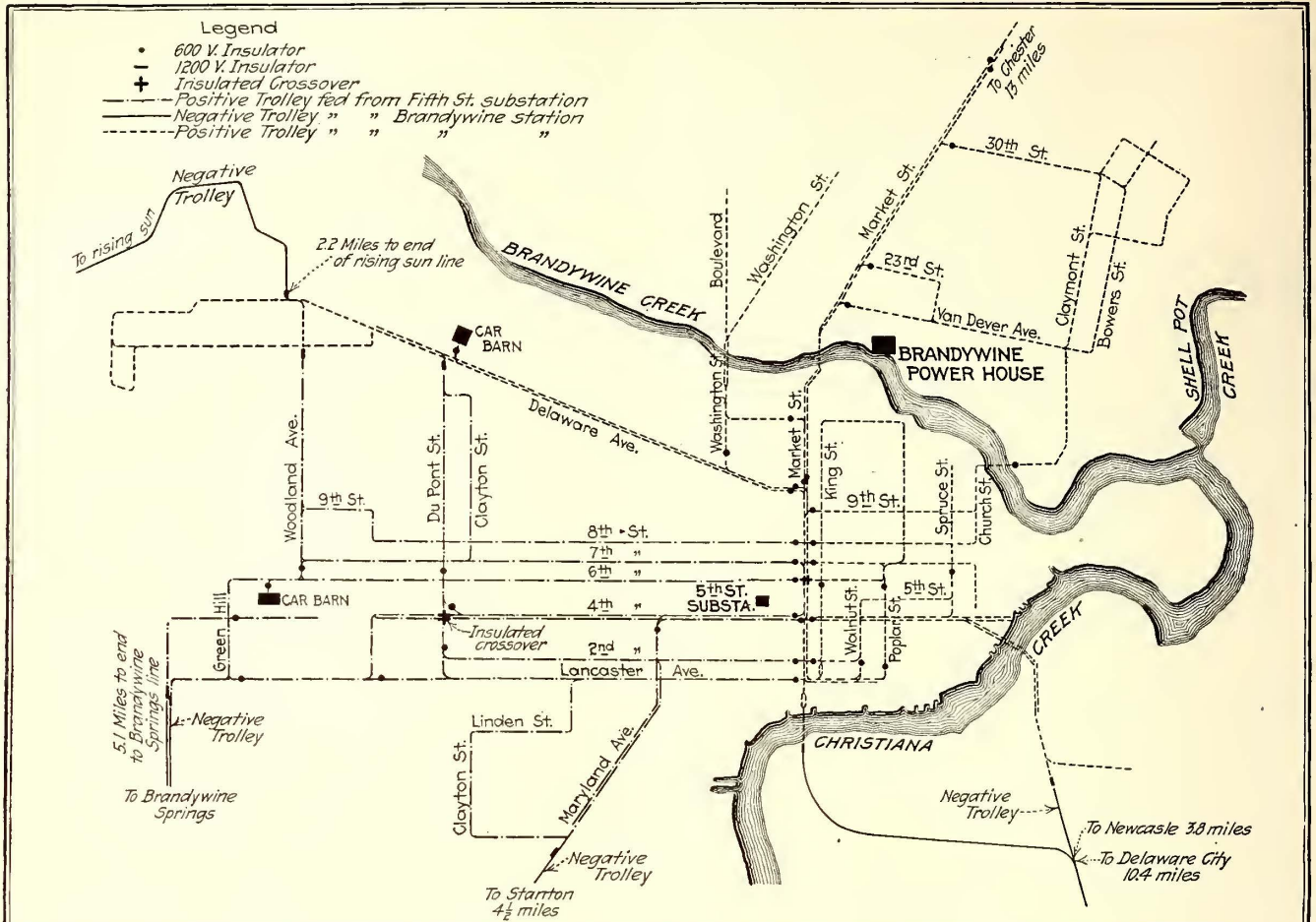
A number of conferences of engineers of the utilities concerned were held and a plan was presented and put in operation. It was conceded that two or three substations in outlying districts would be the best remedy but labor was scarce and manufacturers could not supply the necessary equipment. After much delay two 500-kw. railway rotary converters were installed in the Fifth Street lighting substation near the center of the city railway load and  $1\frac{1}{4}$  miles from the power house. These rotaries took care of nearly 20 per cent of the total load. The generators and switchboard at the power house were arranged to supply a three-wire railway distribution with the neutral connected to rails,



SPECIMEN CHART SHOWING OVER-ALL TRACK DROP WITH TWO-WIRE AND THREE-WIRE DISTRIBUTION

and the negative bus to feeders of four long suburban lines to the west and south of the city, two of which had boosters. The positive bus was connected to the feeders nearer the station and to the north. The negative load averaged nearly 30 per cent of the remaining load on the station. This arrangement of trolley polarity and relative location of stations is shown in an accompanying illustration.

Two of the engine-driven generators were arranged with shunt fields separately excited through D.P.D.T. field switches by which either field could be connected to the positive or negative bus as desired. A simple fool-proof interlocking plug switch was used as a mechanical barrier to prevent the main switch being thrown to the wrong bus and also to supply field current to the proper terminal of the D.P.D.T. field switch. The four feeder panels were provided with double-throw switches in order that the feeders could be connected to either the positive or negative bus. The series boosters automatically functioned properly.



ABOVE, ORIGINAL, AND BELOW, PRESENT, ARRANGEMENT OF THREE-WIRE DISTRIBUTION SYSTEM IN WILMINGTON

Out on the line 24-in. section insulators were provided to separate positive and negative trolleys. Shorter ones would probably have been adequate but those used were found in a manufacturer's stock at reasonable prices. For mechanical reasons a long section insulator was selected instead of two standard 8-in. insulators and those used have given perfect satisfaction. The location of these insulators was carefully selected in order to reduce the probability of both trolley poles being put up at once and so short circuit the insulator, and it was found that the best location was half way between intersecting streets. Through an error opposite polarities were placed on each side of some standard 8-in. section insulators, in which case arcs were carried and maintained across insulators by passing cars until the insulators were destroyed or the breakers at the plant opened.

#### CITY TROLLEY POSITIVE, SUBURBAN NEGATIVE

The current for the four suburban lines to the west and south of the city passed outward over the same tracks through the central district that carried the return current from that central district, so that the resulting current flow in the city tracks was much reduced, which correspondingly reduced the average over-all potentials and therefore the tendency for stray current. This practically eliminated the positive areas of underground structures about the power house and the current flow in drainage was reduced to values only one-third or a quarter of previous values. This is what would be expected when the total resulting current returning to the station was approximately only one-third, although the railway output was reduced by only about 20 per cent by transferring some load to the Fifth Street substation.

In this three-wire distribution in Wilmington only entire feeders were reversed in polarity since it would have complicated car operation to subdivide them further. Moreover, there was not enough copper to give satisfactory voltage on further subdivision. However, in these long sections of positive track there was a tendency for the underground structures to carry a small portion of current and deliver it to cars operating over them. This caused a small floating positive area along these structures directly under the cars, but since this resulted in a two-way voltage condition at any given point, of relatively short duration of positive polarity, it was considered that the actual corrosion of these structures was quite negligible. This conclusion was substantiated by a very painstaking and practical investigation made by the National Bureau of Standards and published in their Technological Paper 72, also in proceedings of A.I.E.E., 1916. However, certain owners of underground lead structures were not ready to accept the idea of practical immunity from damage, particularly in the case of the nationally important New York-Washington underground telephone line that passed for a number of miles under one of these tracks of reversed polarity. This telephone cable was of such great importance during the war that all agreed that no chances could be taken. In this case the cable was made negative to earth at all times by draining it at a number of points through limiting resistances with separate line connected to the negative bus of the Edison direct-current system at the Fifth Street substation, the neutral of which is grounded indirectly to the railway return bus and therefore to the telephone drainage. Later a motor-

driven booster was used as it was more economical. Two-way voltage conditions also existed in reference to gas and water pipes in some localities, but these were generally of short duration of positive polarity.

#### PECULIAR EFFECTS ON SUBURBAN SECTIONS

The distribution of current to long suburban sections of positive rail beyond a city network of normally negative rail leads to some peculiar conditions. One suburban line of positive trolley runs to the northeast along the Delaware River for 14 miles to Chester, where it is also supplied from another station. Along this line near Naaman, about 8 miles from Wilmington, where the tracks cross a small stream, it was noticed that the telephone lead-covered cables showed a two-way voltage condition to earth and always negative to track whenever the Wilmington plant was running three wire. This positive condition had no relation whatever to operation of the cars of that division and it was evident that current was leaving the cables for some other section of the railway distribution. An explanation was advanced that some division of positive rail was responsible, but engineers representing underground structures would not accept this statement until it was definitely proved by graphic charts.

Whenever this load of reversed polarity was removed or supplied by current from positive trolley, the telephone cable at Naaman was decidedly negative to earth at all times. Apparently the tracks did not carry all the positive current required for the long suburban line to Delaware City, and some of the current actually did flow along the tracks and telephone cable to the northeast and pass into moist earth near Naaman to reach the tracks toward Delaware City by way of parallel low-resistance paths along the river, although Naaman and Delaware City are 18 miles apart as the crow flies. Part of the positive condition of telephone cables under the Stanton line, which was remedied by the boosted drainage line, was similarly caused by current endeavoring to get to this same Delaware City line of reversed polarity.

#### FAILURE OF GENERATOR FORCES CHANGES

However, in April, 1918, before the difficulties were corrected, the largest railway generator in the Brandywine plant was damaged beyond repair which required quick action and allowed radical changes. It was deemed inadvisable to replace the lost railway generating capacity in the Brandywine plant, as it was some distance from the load center. Fortunately, at an associated railway property there were two 750-kw. rotaries available which were rushed to Wilmington and installed in the Fifth Street substation with the two 500-kw. rotaries already in operation. This increased the substation capacity sufficiently to allow it to carry 75 per cent to 80 per cent of the entire railway load. Later a substation was installed at New Castle which supplied the Delaware City line south, thus removing the expensive operation of the booster and the difficulties of stray current from this long suburban line. With the Brandywine plant carrying only the load north of the Brandywine Creek and the Delaware City line supplied separately, it was found that the balance of the load could not be carried satisfactorily from the Fifth Street station without an expensive installation of negative copper to supplement the tracks with some adaptation of an insulated negative return system to prevent unreasonable stray currents, or

without resorting to an unlimited pipe drainage system. This latter was opposed by owners of underground structures and not generally approved by the railway management. Rather than install another substation beyond the city limits to the southwest, the three-wire distribution was again used, but quite differently from the former practice at the Brandywine plant.

In the substation, rotary converters could be arranged for reversal of polarity more conveniently than generators, as they could be maintained as self-excited machines. A plan of mechanical interlocking was provided by field plug switches to prevent the main switch from being thrown to the wrong bus, and the switch-board was provided with positive and negative buses

tribution can best be obtained by considering the accompanying illustration which assumes a total of nine cars taking 50 amp. each. With three cars operating on negative trolley in the middle of the group the over-all track drop from *D* to *A* would be that caused by 150, 100 and 50 amp. between *A* and *B*, and the gradient is always toward the station. With all cars operating from positive trolley the over-all track drop from *A* to *D* would be the result of 450, 400, 350, 100 and 50 amp., or seven and a half times the drop in the first case, assuming that the load is equally distributed and the track is all of the same resistance throughout. Furthermore, the drop from *B* to *A* in the three-wire systems will be one-quarter the

ELECTROLYSIS TESTS—WILMINGTON, DEL.—COMPARISON THREE-WIRE AND TWO-WIRE OPERATION

Date	Time		Oper.	Positive Post	Negative Post	Chart No.	Dist.	Max. Volts		Average Volts			Alg. Aver.	Remarks	
	From	To						+	-	+	%	-			%
<i>Location—Front and Washington Streets</i>															
6/11/20	11.10	11.30	3-W	Earth	Cable	75	..	0.3	0.22	0.08	60	0.04	40	... Cable negative 60%	
	11.30	12.00	2-W	Earth	Cable	75	..	0.31	0.13	100	...	...	100	... Cable negative 100%	
	12.00	12.08	3-W	Earth	Water	76	..	0.8	0.4	0.35	99	Momentary	...	... Water negative 99%	
	11.30	12.00	2-W	Earth	Water	76	..	0.9	0.016	0.3	99	Momentary	...	... Water negative 99%	
	11.00	11.30	3-W	Gas	Earth	77	..	0.088	0.100	0.015	40	0.030	60	... Gas negative 60%	
	11.30	11.36	2-W	Gas	Earth	77	..	0.100	0.06	0.030	50	0.020	50	...	
	11.00	11.30	3-W	Cable South End	Cable North End	78	4'	3.8MV	0.06	1.5MV	100	...	...	...	Current flow north 100%
	11.30	11.36	2-W	Cable South End	Cable North End	78	4'	4.4MV	0.06	3.0MV	100	...	...	...	...
<i>Location—Front and Tatnall Streets</i>															
6/11/20	2.00	2.30	3-W	Cable	Earth	79	..	...	1.5	...	...	0.8	100	... Too heavily drained	
	2.30	2.37	2-W	Cable	Earth	79	..	...	1.6	...	...	1.2	100	... Too heavily drained	
	2.00	2.30	3-W	Earth	Gas	80	..	...	0.12	...	...	0.04	100	... Gas positive 100%	
	2.30	2.37	2-W	Earth	Gas	80	..	...	0.14	...	...	0.08	100	...	
	2.00	2.30	3-W	Earth	Water	81	..	...	0.18	...	...	0.08	100	... Water positive 100%	
	2.30	2.42	2-W	Earth	Water	81	..	...	0.30	...	...	0.16	100	... Water positive 100%	
	2.00	2.30	3-W	Cable South End	Cable North End	82	5'	12MV	0.06	7MV	100	...	...	...	...
	2.30	2.38	2-W	Cable South End	Cable North End	82	5'	12MV	4MV	9MV	60	2MV	40	...	Current flow north
<i>Location—Delaware Avenue and Jackson Street</i>															
6/14/20	3.09	3.30	3-W	Cable	Earth	90	..	...	1.4	...	...	0.8	100	...	
	3.30	4.00	2-W	Cable	Earth	90	..	...	2.2	...	...	1.3	100	...	
	3.09	3.30	3-W	Cable South End	Cable North End	91	..	4.8MV	0.06	1.8MV	100	...	...	...	
	3.30	4.00	2-W	Cable South End	Cable North End	91	..	4.8MV	2.4MV	...	...	1.4MV	100	...	
	3.17	3.30	3-W	Gas	Earth	92	..	...	0.1	...	...	0.03	100	...	
	3.30	4.00	2-W	Gas	Earth	92	..	1.8	0.1	0.8	65	0.05	035	...	
	3.16	3.30	3-W	Gas	Bell cable	93	..	1.0	0.06	0.35	100	...	...	...	
	3.30	4.00	2-W	Gas	Bell cable	93	..	1.4	0.06	0.70	100	...	...	...	
	...	...	3-W	Cable	Gas	Ind.	..	...	0.4	...	...	0.2	100	...	
	...	...	2-W	Cable	Gas	Ind.	..	...	1.4	...	...	0.6	100	...	
<i>Location—Delaware Avenue and Adams Street</i>															
6/14/20	2.00	2.30	3-W	Cable	Earth	94	..	...	1.0	...	...	0.4	100	...	
	2.30	2.40	2-W	Cable	Earth	94	..	...	1.4	...	...	0.8	100	...	
	2.00	2.30	3-W	H. P. gas	Earth	95	..	...	0.25	...	...	0.14	100	...	
	2.30	2.45	2-W	H. P. gas	Earth	95	..	...	0.25	...	...	0.14	100	...	
	2.00	2.30	3-W	Cable South End	Cable North End	96	7'	2.0MV	0.4MV	0.6MV	60	0.01	40	...	
	2.30	2.40	2-W	Cable South End	Cable North End	96	7'	1.6MV	3.2	0.9MV	50	2.0	50	...	
	2.00	2.30	3-W	High pressure gas	Water	97	..	...	0.4	...	...	0.3	100	...	
	2.30	2.45	2-W	High pressure gas	Water	97	..	...	0.4	...	...	0.3	100	...	
	2.15	2.30	3-W	High pressure gas	Rail	Ind.	..	...	3.8	...	...	1.5	100	...	
	2.36	2.49	2-W	High pressure gas	Rail	Ind.	..	...	4.4	...	...	2.0	100	...	
	...	...	3-W	Cable	Gas	Ind.	..	...	0.6	...	...	0.4	100	...	
	...	...	2-W	Cable	Gas	Ind.	..	...	0.6	...	...	0.4	100	...	
	...	...	3-W	Bell cable	Power cable	Ind.	..	...	0.3	...	...	0.1	100	...	
	...	...	2-W	Bell cable	Power cable	Ind.	..	...	0.3	...	...	0.1	100	...	
	...	...	3-W	Cable	Track	Ind.	..	...	2.2	...	...	1.2	100	...	
	...	...	2-W	Cable	Track	Ind.	..	...	2.2	...	...	1.2	100	...	

of 1,200 volts with neutral connected to rails and certain feeders were provided with double-throw switches similar to the arrangement at the Brandywine plant for its feeder panels.

An accompanying illustration shows the relative location and extent of positive and negative trolley sections. It will be noticed that all the sections supplied with negative trolley have sections of positive trolley beyond and on either side and to some extent nearer the substation. With the interconnection of tracks and cross lines the over-all potential drop in any section of one polarity is small and the exchange of current from track of one polarity to track of opposite polarity is much less than by the original plan when the long lines of negative trolley extended beyond the city limits. The station output averages about 2,000 amp. with peak load of about 3,000 amp., 20 to 30 per cent of which is supplied to negative trolley.

A conception of the principle of the three-wire dis-

tribution can best be obtained by considering the accompanying illustration which assumes a total of nine cars taking 50 amp. each. With three cars operating on negative trolley in the middle of the group the over-all track drop from *D* to *A* would be that caused by 150, 100 and 50 amp. between *A* and *B*, and the gradient is always toward the station. With all cars operating from positive trolley the over-all track drop from *A* to *D* would be the result of 450, 400, 350, 100 and 50 amp., or seven and a half times the drop in the first case, assuming that the load is equally distributed and the track is all of the same resistance throughout. Furthermore, the drop from *B* to *A* in the three-wire systems will be one-quarter the

TESTS SHOW IMPROVED CONDITIONS

drop between the same points under two-wire operation and the current returning to the plant will be one-third.

After the installation had been completed for some time, a joint test was made by representatives of gas, water, telephone and railway interests to determine the difference between two- and three-wire distribution out of the Fifth Street substation. In this test one-hour graphic charts were used almost entirely, showing about half an hour's record of three-wire operation followed by about half an hour's record of two-wire operation at the same location without change of instruments or connections. This was accomplished by simply throwing the double-throw feeder switches at predetermined times.

Thirteen of the fourteen records of over-all track voltage drop to outlying points showed a reduction of

30 to 60 per cent, three records showed short-period reversals. Current flow in telephone lead-cable drainage was reduced by about 40 per cent. Current flow in power lead-cable drainage was reduced about 60 per cent, and current in the drainage of gas and water pipes was reduced about 50 per cent. In the area supplied by the Fifth Street substation current flow in underground structures was reduced from 10 to 80 per cent but in some outlying sections there were reversals of current flow varying from 10 to 30 per cent of the time. The potentials between underground structures and from structures to earth were generally reduced as would be expected. A total of about 300 graphic records were made and many readings with indicating instruments were recorded, but the former were relied upon where accurate comparisons were to be made, since they introduced the time element.

A sample graphic chart is shown in an accompanying illustration, as is also a form used in tabulating records for comparison.

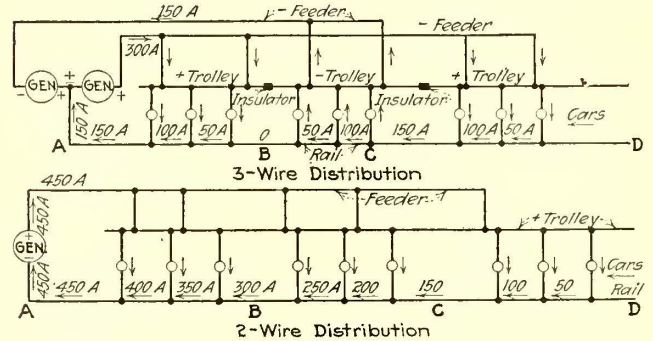
CONCLUSIONS

The three-wire distribution as first installed by making remote suburban lines operate with a negative trolley was not very satisfactory, and it would doubtless have required considerable expense to make it more effective. The negative trolley section hung approximately midway between sections of positive trolley is much better in that the average potential gradients are always toward the plant. Furthermore, a continuous gradient toward the end of the line all the time on long suburban lines with negative trolleys is objectionable.

The three-wire operation of Fifth Street substation substantially reduced over-all track potentials, current flow in underground structures, drainage currents into substation, potentials between structures and potentials between structures and earth to such values that equiva-

of relatively short duration and small values it was considered that damage could not easily occur. There have been one or two locations of cable failure where these two-way voltage conditions of short duration of positive polarity exist, but since there have been cable failures where cables are continuously negative it is held that the predominating cause is something other than stray currents.

The three-wire railway distribution provides a very economical and practical plan, particularly for city districts of heavy loads where there are numerous parallel



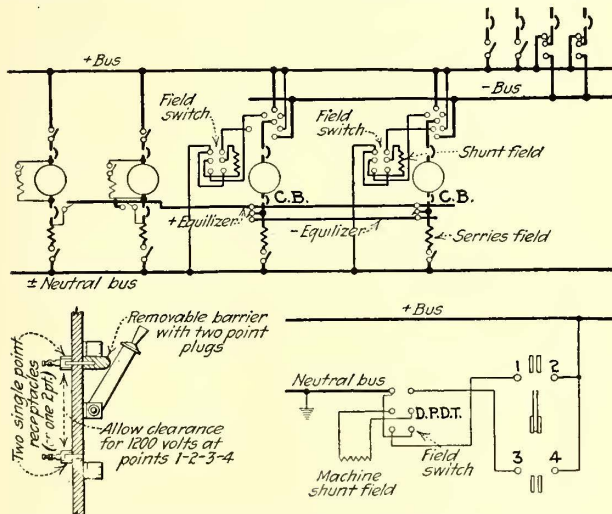
DIAGRAMMATIC COMPARISON BETWEEN TWO-WIRE AND THREE-WIRE RAILWAY DISTRIBUTION

and intersecting tracks. The expense of providing the additional distribution bus and reversing the polarity of one or more machines, or its equivalent, is very reasonable. Care should be taken to have a good load factor on the machines carrying the reversed polarity. The greatest economy is derived in the saving of return copper. At Wilmington there are only about 2,400 ft. of 500,000 circ.mil return copper cable in addition to an equivalent of 1,200 ft. of 1,000,000 circ.mil cable necessary to connect the station return or neutral bus to the tracks at the two nearest locations.

In Wilmington today the three-wire system for railway distribution from substations has been applied with success to the entire system with the exception of about 10 per cent of the load north of Brandywine Creek, which is carried by the power house and a small substation used to supply a suburban line south of the city.

Motor Trucks in New England

UNDER the title "Root, Hog or Die; the New Englander and His Railroads," Philip Cabot discusses New England transportation problems in the August *Atlantic Monthly*. While most of the article relates to steam railroad problems, the author has quite a little to say about the competition being given to the railroads in freight transportation by motor trucks. According to him, at the present time, 2,000,000 ton-miles are being made annually by trucks in New England, and five years hence, if this growth continues, the figure will be 60,000,000. The cost of this transit in depreciated highways falls principally on the taxpayer, and 2,000 miles of highway will have to be reconstructed in Massachusetts alone during the next five years. The cost at \$40,000 a mile will amount to \$80,000,000. Even a tax of 10 cents a ton-mile (corresponding to about \$600 a truck per year) would not cover the cost of destruction to the roads caused by these trucks. The proper agency for carrying freight in New England, in the author's opinion, is the railroad, except for distances of 6 miles or less.



SCHEMATIC ARRANGEMENT OF GENERATORS AND SWITCHES FOR THREE-WIRE OPERATION

lent results could be accomplished only by a very heavy expenditure for return copper or the construction of a substation to take care of suburban lines.

The operating voltage at cars, particularly at remote points in the neighborhood of junction between positive and negative trolleys, was considerably improved.

At many points a two-way voltage condition existed between some underground structures and earth or other structures, but where the positive conditions were

## The Problem of the Fare

Lord Ashfield in a Magazine Article Analyzes the Factors on Which Fares Should Be Based and Discusses the Relative Merits for British and American Cities of the Zone or Differential Fare

IN THE *19th Century and After* for June, 1921, Lord Ashfield, chairman of the board of directors for a number of the transportation systems in London, contributes an article of 9,000 words or more on flat and zone fare systems. At the beginning of his article he points out that London and New York present parallel features in urban transport, but that New York has the flat fare system based on 5 cents, whereas London has a differential fare system ranging according to distance from 1d. to 1s. or more. Continuing, he says, in part:

Both systems appear to have a general development of passenger traffic, and recent figures of rides per head as shown below are uncannily similar:

RIDES PER HEAD		
	1920	1913
London.....	404	301
New York.....	421	352

The average fare in New York is just over 5 cents, whereas in London it is just over 1½d. or about a half. In 1920 investigation of financiers and experts in New York indicated that 8 cents was necessary, and in London the figure was nearly 3d. This raises the issue of the comparative merit or demerit of the contrasted systems of fares. The subject will be discussed under four heads, namely: (1) The fare as the index of the value of the service received; (2) the fare as the index of the value of the service rendered; (3) the fare in relation to the cost of service, and, finally (4) the fare in relation to public or civic policy.

If persons live scattered around in suburbs and work in the center of the city and each day are carried to and from their work, the value of the service received by each of them may be said to be identical. It is not of any more real value to be carried 5 miles than 3 for this necessary purpose. In fact, the travel is often a bother, and the time occupied is an expense. Is it therefore reasonable to add to the expense by charging a higher fare? There in brief is the economic argument which leads to the flat fare—one price for all rides. But though the bare service received by the passenger may be identical in value for all, the effects of the service are dissimilar, and, overlooking for the moment other considerations, the real value might just as well be reflected in the fare as in the rent or rates. For instance, in London the rent for equivalent accommodations normally falls as the center is left. In New York it is reported that the rent for the same accommodations in upper New York is the same as in lower New York and that the accommodation is the same.

The flat fare of America is the consequence of an accidental circumstance, the denominations of the coinage. The smallest effective coin in constant use in England is a penny. In America it is the nickel. This disparity in value at the very starting point of a fare system must be a governing factor in the development. In England a differential fare scheme must start with a penny as its initial fare and the question is: What is a fair pennyworth of travel? In the small cities it was found that the cost of the average length of journey taken in them was amply met by the collection of a penny from every passenger. In the larger cities, where the distances to be covered were greater, the penny was insufficient, and as the penny was deemed the indispensable starting point for a fare system, additions were made to it for the further distances, and the differential fare became inevitable.

In America the same question was presented except that it was: What is a fair nickel's worth of travel? Apart from the recent breakdown of the 5-cent fare owing to the

war, there were cases in which the extension of the cities had already proved too great a strain upon it. In Chicago and New York (1916) the length of journey had reached 6½ and 5¾ miles respectively on the elevated and subway lines, while on the street railways it exceeded 4 miles, and revision in some form could not long have been avoided. Would American practice follow English practice and from the initial flat fare develop as required fares at higher rates for the extending routes of street railways?

The 5-cent flat fare having prevailed for so long a period and the development and extension of the cities having taken place under the conditions established by it, it has become the ingrained custom for America. The greatest resistance is shown to the introduction of the zone or differential fare. It is realized that it must mean alterations in land values and property values, distribution of population, decentralization of the city and the creation of local centers of activity and amusement. Every vested interest is opposed to it. It is a change of a revolutionary character. Therefore America struggles to keep the flat fare, and it has disappeared in favor of a zone fare system in thirteen cities only.

The question of giving change is also a consideration. No one cares for odd cents.

When a flat fare reaches a level of 10 cents its acceptance must be held to indorse the principle that every ride, irrespective of length, is the performance of service of equal value to every rider. But as a measure for expanding the volume of traffic to the utmost it cannot be sound. Surely some must pause and reflect on the value of the service to be received before paying away their dimes for a brief journey. There is interesting confirmation of this in the average carloads of American and English street railway systems. In spite of the fiercer temporary congestion in American cities, the average carload on an English system is about half as heavy again as on an American system. This is the refreshing fruit of the low initial fares which induce casual riders at all hours of the day. In Berlin also an increasing flat fare has driven away passengers. In contrast with this the underground railway of Berlin, which had a differential fare scheme based on the number of stations covered by the journey, has at least been able by more flexible adjustments of its fares to maintain itself in a solvent condition. There is a narrow upward limit to a flat fare. It tends to disaster where this narrow limit is exceeded. It depends for its validity upon the principle that all journeys are of equal value to the passengers. As soon as the passengers become conscious of a difference in the value of the rides received they become willing and anxious to recognize a difference in the fare paid. In fact, they are found to insist upon a system of fares which commends itself to them as equitable before they will ride freely.

### THE FARE AS THE INDEX OF VALUE OF THE SERVICE RENDERED

The nature of the service rendered in general is the passenger-mile, so that the observation of this principle demands a system of differential fares increasing with distances covered. At the outset, however, a distinction must be drawn between a zone system and a differential system of fares. A zone system of fares defines a series of areas and establishes a rate of charge for each area. The fare paid for a journey across several areas is the sum of the charges applicable to those areas. An intending passenger near to the boundary of an area is induced to walk to the boundary to save one of the charges. This feature has been noticeable in American cities where outer zones have been added to the initial 5-cent central zone at a charge of 2 cents per zone covered. It is a common defect in a zone system that the fares are not overlapped. This inequity is the mistake



which has spoiled and wrecked so many of the ventures into zone schemes in America.

The differential system of fares is based upon stages, being the distances between station and station, or between point and point used in defining the fares. At any point there is a complete system of fares for that point in relation to every other point, and the points are usually of such a number that for each rate of fare there is a choice of two or three as destinations in every direction.\* Thus the fares are always flexible and capable of fare adjustments to the total distance covered wherever the passenger starts or finishes his journey. This is the system of fares to which experience has always tended in this country [Great Britain]. Whatever experiments there may have been with flat fares, as when the Central London Railway was the "two-penny tube," they have uniformly broken down into a differential fare scheme, and the financial results of the change have been uniformly beneficial.

As already explained the 1d. fare is the dominant fare here, and every scheme of fares must, at any rate before the war change in price level, have taken it into account. It was too low a unit on which to found a flat fare system. Thus, as soon as journeys exceeded a length of 2 miles on the average, the higher fares were secured by additions to the 1d. for the further distances. Table I shows the rates of fare and number of passengers carried at each rate of fare for the three principal agencies of passenger transport in London in 1913.

TABLE I—SHOWING PASSENGERS (LAST 000 OMITTED) AT DIFFERENT RATES OF FARE IN 1913 ON LONDON TRANSPORTATION SYSTEMS

Ordinary Passengers	Under-ground Railways*	Per Cent of Total	Motor Omnibuses	Per Cent of Total	L.C.C. Tramways	Per Cent of Total
Number of passengers carried at fares of:						
1d. or less.....	22,376	33	464,933	69	368,714	86
Over 1d. up to 2d....	30,412	46	148,035	22	51,229	12
Over 2d. up to 3d....	12,814	19	43,462	6	6,717	2
Over 3d.....	997	2	19,898	3	450	..
Total.....	66,599	..	676,328	..	427,110	..
Average fare paid per ordinary passenger						
	1. 8d.	..	1. 3d.	..	0. 9d.	..

\* London Electric and Central London Railways only. Other records not available in detail.

The percentages reveal the relative importance of the different fares. The question whether the same number of people would have paid the average fare as a flat fare is the test of the soundness of the policy. All the available evidence is against the proposition. Almost every change in fare made in London over the decade that preceded the war has shown as its immediate results something approximating to the same gross receipts. The passengers rose or fell in numbers as the fare fell or rose in rate. The product was little altered. When, however, the upward change in fare was justified, the volume of traffic at the new fare was not checked except temporarily, but soon continued to rise again with the general growth of travel.

The critical argument in favor of the differential fare may be studied in the case of the halfpenny fare conducted on the chosen ground of Glasgow. While the average expenses and charges per passenger carried never fell below 0.70d., as much as 64 per cent of the total number of passengers carried were being charged no more than a halfpenny. In the last full year of their currency the number of passengers at halfpenny fare was 305,000,000. Ten years earlier it was 62,000,000. The expansion of traffic had been sensational and warranted their introduction. The passengers were created from those who previously had walked on account of the 1d. fare. The footwalks were cleared of pedestrians and the vacant seats in the tramcars filled. So long as there were vacant seats in the tramcars it was expedient to fill them at any price, for every passenger brought in helped to pay a share of the cost of operation and so averaged them down to a smaller sum per passenger. The Glasgow halfpenny fares were withdrawn on May 31, 1920, when they had become uneconomic in reality as well as in appearance.

\* [EDITORS' NOTE—In other words, fares are not determined by fixed zone lines but by the distance traveled by the passenger.]

A converse illustration is the introduction of the cheap midday fare of 2d. on the London County Council Tramways. The motor omnibuses were compelled to follow the practice in self-protection. The results for the motor omnibuses was that in a week 198,000 passengers used the cheap tickets, represented in part by passengers already riding at the ordinary fares and therefore gaining by the special cheap fares, and in part by further passengers induced to ride by reason of the cheaper facility. The loss on the former passengers is estimated at £9,500, the gain on the latter passengers is estimated at £8,750, so that the ultimate loss is £750 a week. Here the abandonment of the differential fare over 2d. led to a diminution of earning power because the especially attracted traffic was insufficient to balance the reduced earnings from the existing traffic.

So far all the evidence shows that the settlement of a scheme of fares on the basis of the value of the service rendered is generally approved and leads to the creation and retention of the maximum volume of traffic. This feature is a most important argument in favor of the differential fare. The short distance traffic, which a differential fare system encourages, is ordinarily casual traffic, arising not at the times of peak load when the change-over from home to business or business to home is taking place, but throughout the day. It occupies the vehicles when they are more nearly empty and it is turned over quickly, one passenger succeeding another and occupying the same seat. It must have been a misguided transference of these characteristics of short distance traffic which led up to the cheap midday fare for long distance traffic, for a little reflection shows they are not applicable. Long distance traffic is not casual, it moves with a purpose and therefore is not stimulated by cheapness to a satisfactory extent. It also persists in occupying the seats, for it cannot be turned over. Finally, a differential system of fares seeks a satisfactory average fare over all passengers, and if fares are introduced below this satisfactory average on the one side, they must be balanced against fares above this satisfactory average on the other side.

The strongest case for the differential fare has resulted from the general advance of all fares consequent upon war conditions. To make, as in America, an initial charge of 7, 8, 9 or 10 cents per ride is obviously a depressing treatment for traffic. As the desired average fare gets higher, it becomes more surely convenient and politic to reach this average by actual fares both above and below it. Table II gives the results for the revision of fares on the Underground Railways in September last and is based upon an analysis of the local ordinary traffic for a week in September, 1920 and 1921.

TABLE II—SHOWING EFFECT ON TRAFFIC OF FARE INCREASE, LONDON UNDERGROUND RAILWAYS

Passengers Carried	February, 1920		February, 1921		Loss	
	Number (1)	Per Cent of Total (2)	Number (3)	Per Cent of Total (4)	Number (5)	Per Cent of Total (6)
Over one station distance	171,370	6	117,689	4	53,681	31
Over two stations distance.....	423,934	14	325,864	12	98,070	23
Over three stations distance.....	431,478	14	396,093	15	35,385	8
Over four, five and six stations distance....	1,074,465	36	991,222	37	83,243	8
Over more than six stations distance.....	906,956	30	839,857	32	67,099	7
Total.....	3,008,203	..	2,670,725	..	337,478	11

The table shows two inter-related but expected features. First, that the longer the journey taken the smaller the percentage loss in traffic. The percentages in the last column fall steadily. Second, that the higher the fare the larger the proportion of long distance traffic carried.

THE FARE IN RELATION TO THE COST OF SERVICE

The third principle which might govern the determination of a scheme of fares is the cost of service. In practice it runs so nearly parallel with the value of the service rendered, unless the circumstances are exceptional, that there is a chance of the two aspects not being clearly distinguished. An analysis of costs shows that there are some charges, like terminal and overhead expenses, interest, rentals, re-

erves, and fixed charges, which properly may be divided equally among all of the passengers carried. Another set of expenses are those concerned with the running of the cars, and these may properly be proportioned to the passenger-miles run. An analysis of costs, as applied to the tube railways in London, shows for 1913-1915 a total initial charge per passenger of 0.95d. and in 1920 1.25d. and for the train working and track expenses per passenger mile, for 1913-15, of 0.20d. and for 1920 of 0.40d. A comparison between the scale actually adopted for ordinary fares in the recent revision and the theoretical scale based on this analysis is set out in Table III.

TABLE III—SHOWING THEORETICAL AND ACTUAL SCALE OF FARES

Theoretical Scale, d.	Distance Not Exceeding, Mile	Actual Scale, d.
1 85	1	1 50
2 15	1½	2 00
2 75	2½	3 00
3 35	3½	4 00
4 25	5	5 00
5 15	6½	6 00
6 05	8	7 00
7 25	10	8 00
8 45	12	9 00

There could hardly be a closer approximation between theory and practice. It will be seen that the scales commence with a moderate initial charge and that as the distance increases the addition grows less in proportion. It gives a flattening effect with the accumulation of miles but never becomes wholly flat. The rate per mile charged to passenger regresses with each mile of the journey. Such a scale corresponds intimately to the value of the service rendered and bears fairly on the passenger. It has public advantages in relaxing the burden for the outlying suburbs and so encouraging the spread of population. This flattening out of the fare scale is an intermediate state between acutely differentiated fares and flat fares.

Already the public or civic relationship of a fares policy has been anticipated, but it is not possible to omit them from regard for long. It is a matter of serious regret that fares have become a political issue. Maybe it is safer to discuss America than London. The 5-cent flat fare was an excellent opening for the transport agency. It was exceedingly remunerative, readily paid and effective in spreading out the town beyond walking distance. When a change was needed to maintain the credit and efficiency of the transport agency, it was bitterly resented. A big American city is a single unit. It has a theater center, a shopping center, a business center and all traffic converges upon these unique spots. The flat 5-cent fare encouraged this. The zone fare has the opposite influence. It tends to decentralize. As soon as it costs more than 5 cents to reach what is wanted, the time has arrived when that which is wanted must move and disperse. It is an educative contrast to survey a big American city and London. London is a place of submerged towns, but though they are submerged they are not lost. The differential fare has been their safeguard and prevented Westminster, for all its magnificence, entirely obliterating them.

It is said that the flat fare prevents congestion of the population on an urban site, but are American cities any less congested than English cities? Boston, Mass., for instance and Birmingham are alike in density of population, so are Cleveland, Ohio, and Sheffield. Brooklyn matches Manchester; Manhattan equals Bethnal Green or Shoreditch, Southwark or Stepney. There is nothing to choose. The city of Paris proper, which, almost unique among European cities, has a flat fare, is the most congested of all.

From a public point of view the most significant measure of success attaching to a scheme of fares is the enlargement of the habit of travel. Freedom of movement is the essential condition of healthy urban lines. In New York and London this is assured. Every citizen—man, woman or child—travels on the average over 400 times a year. It is hard to realize what a vast accomplishment this is. The mere time consumed must be a goodly slice of life. And all those journeys have to be paid for. They represent for Lon-

don, in a typical family of five, a sum of more than £16 out of the family income, four weeks' pay for a workman. Yet it is cheap. Free movement results in a growing sense of solidarity.

In conclusion, while there would appear to be a favorably balanced argument for the differential fare, sufficient has been said to show that there can be no dogmatism about a theory of fares. There is certainly not one fare scheme adaptable to all urban conditions. The information used for this article was collected in the study of the specific problem of fares for London, and it is hoped that it may lead to the right scheme of fares being adopted. Similar studies would lead to similar right solutions for other cities, and this article sketches a line or lines of approach to the problem of fares.

### Safety Cars Make Good in Oakland

ON DEC. 1, 1920, the San Francisco-Oakland Terminal Railways substituted ten standard Birney safety cars for five two-man cars on a route in Oakland. These cars operate over eight blocks on Broadway, Oakland's principal business street, on a short run between Seventh Street and Broadway and Alcatraz Avenue and are sandwiched in between larger double-truck, two-man cars on long through runs.

Over these eight blocks there are nine other car lines averaging 182 cars per hour, as well as four intersecting car lines, with the crossings under the control of traffic officers. On these four intersecting cross streets there is a total service of 170 cars per hour. Broadway also accommodates a very heavy movement of automobiles in both directions as well as a large amount of cross traffic from the side streets.

COMPARATIVE RESULTS OF SAFETY CAR OPERATION—OAKLAND, CAL.

	10 One-Man Cars April, 1921	vs. 5 Two-Man Cars Nov., 1920	Increase or Decrease	Per Cent Change
Car-miles operated.....	30,534	15,262	15,272	100.00
Per car-mile:				
Receipts.....	25 01c.	33.80c.	8 79c.	26.0
Expenses—Platform.....	7 42c.	11.05c.	3 63c.	32.8
Power.....	1 72c.	4.65c.	2 93c.	62.9
Net receipts*.....	15 87c.	18.10c.	2 23c.	12.32
Seat-miles.....	977,092	610,478	366,614	60.0
Seat-miles per car-mile.....	32	40	8	20.0
Per 100 seat-miles:				
Receipts.....	78 17c.	84 49c.	4 32c.	5.12
Expenses—Platform and power.....	28 56c.	39 25c.	10 69c.	27.20
Net receipts*.....	49 61c.	45 24c.	4 37c.	9.67
Power consumed at 1.409 cents per kilowatt-hour.....	37,282	50,364	18,082	26.00
Power consumed per car-mile.....	1 22	3 30	2 08	63.0
Revenue passengers.....	127,294	85,970	41,324	48.0
Revenue and transfer passengers.....	154,432	104,208	50,224	48.2
Passengers (all kinds) per c-m.....	5 07	6 84	1 77	25.9
Load factor—per cent use of seats.....	15 82	17 12	1 30	.....

\* After deduction of platform and power expenses only.

Through this maze of traffic the movement of safety cars has been accomplished without delay, inconvenience or accidents, and the results, as shown in the accompanying table, indicate that with 100 per cent increase in cars operated and 60 per cent in seat-miles the receipts have increased 48 per cent, although the number of seats per car has decreased 20 per cent. An analysis based on the car-mile as a unit of comparison indicates receipts decreased 26 per cent and that net operating revenue after deducting power and platform expense (all others being considered unchanged) decreased but 12.32 per cent, indicating in reality a gain of 13.68 per cent in favor of the safety car.

On a seat-mile basis due to a traffic gain of only 48 per cent the receipts are still 5.12 per cent off, even though platform and power expenses show a reduction of 27.2 per cent. The benefit from the change, however, is more clearly reflected in the gain in net operating revenue, which amounts to 9.67 per cent.

# Bus or Retrack?

**A Study on the Place of the Motor Bus, Particularly in Cases Where the Existing Traffic on Electric Railways Is Not Sufficient to Justify New Rail and Continuance of the Paving Burden**

BY WALTER JACKSON  
Consulting Engineer

**D**URING the early spring of 1921 the writer had occasion to consult for the J. G. Brill Company and others on a number of situations where the motor bus is well adapted to supplement and even supplant the electric car with advantage to the operating company.

One of these is where a high-voltage interurban railway is required by ordinance to make stops for local passengers in one of the towns through which it operates. No city car for the voltage used is practicable, so that the suggestion has been made that the local traffic be handled by motor bus. Such a plan would not only relieve the interurban cars of an unprofitable class of traffic but by cutting out these local stops would increase the scheduled speed of the interurban cars. In this instance it is merely a question of determining whether there are enough local city riders along the interurban route to make a separate bus line worth while. Unlike the following cases, this situation has not yet been analyzed in detail.

## SITUATION 2—CROSSTOWN ROUTE ON M STREET

A second and far more important case is that of a large Eastern electric railway which had a number of situations involving the alternative of motor buses, for retracking or for extensions of existing lines. One was a tie line (situation 2, M Street) with a double track 1.1 miles of route in length, connecting two trunk lines. Most of the traffic consists of passengers who transfer to or from one of the intersecting trunk lines. During the greater part of the day the cars on this 1.1-mile route are operated as shuttles, but during the usual peak hours a certain number of cars are through-routed over this line from one of the two trunk lines, though at large expense. The question of the future of this route, which has never been profitable, came up through the decision of the city to repave the street. As the railroad was subject to the usual paving burden, a renewal of the trackway and paving for 18 in. each side of the rails, the cost\* would have been as follows:

IF DOUBLE TRACK	
Track labor and material.....	\$72,372
Paving labor and material.....	19,278
Total.....	\$91,650
IF SINGLE TRACK	
Removing one track and repairing and relocating the other track in center of street.....	
Track labor and material.....	\$49,342
Paving labor and material.....	11,428
Total.....	\$60,770
Net cash cost of removing track poles and overhead if track service is abandoned.....	\$10,396

An analysis showed that only 1,700 passengers (850 each way) made use of this route on business days. Of

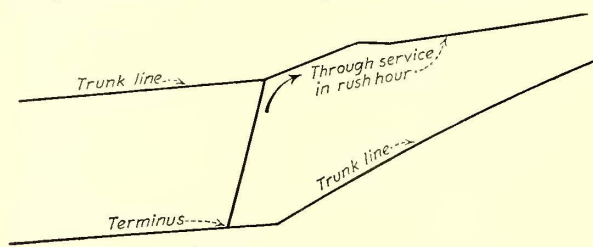
\*NOTE: All figures were prepared during the winter of 1920-21 and early spring of 1921. Present costs of both track and bus are lower, but it has been thought wiser to make no changes from the figures in the original reports.

this number 1,100 were through-route (3.4 miles) rush-hour riders and the rest were transfer passengers. The headway during non-rush hours was fifteen minutes and during rush hours was seven and one-half minutes. Only 62,400 car-miles were run on the 1.1 mile section of this route during a year. The cost of the proposed investment in track and paving (\$91,650) at 8 per cent would amount to \$7,332 per year, which would be equivalent to 11.7 cents per car-mile.

On the other hand, it was estimated that one twenty-five-seat all-steel bus at \$8,000 with one as reserve would do the same shuttle service. As the factor of cost of removing old track, etc., would be the same whether bus or car was used, the relative capital requirements worked out as follows:

	Buses	Cars
First cost as described.....	\$16,000	\$91,650
Fixed charges per year with 62,400 vehicle-miles (cents)....	2.1	11.7
74,000 vehicle-miles (cents)....	1.7	9.9

The cost of operation (for a two-man car) was 35 cents per car-mile. The expenses of the bus on the



basis of a useful life of the bus of 100,000 miles and a gasoline consumption of 6 miles to the gallon worked out as follows:

OVER-ALL COSTS PER BUS-MILE	
	Cents
Interest on investment.....	1.7
Depreciation, 100,000-mile life.....	8.0
*Conducting transportation.....	12.0
Maintenance of equipment, except tires.....	4.0
Repairs and renewals pneumatic tires.....	5.0
Gasoline and lubrication.....	5.5
Garage inspection and general license fees, insurance.....	3.8
Total.....	40.0

\*This item is very high because of the long layovers on this particular route and because the wages were figured as two-thirds instead of one-half the car wages. On routes with more revenue-miles per hour, as on fairly long runs, this figure would be 10 cents or less.

In other words, the bus would cost 40 cents per vehicle-mile as against 45 cents for the cars. With a larger number of buses certain of these figures could be reduced appreciably. It should also be remembered that the great advantage of the motor bus to the electric railway in instances like these does not lie so much in the annual savings as in the release of large sums of money for more productive purposes than the re-tracking and repaving of unimportant car routes. If, as occurred in this case, the proposal to supersede track by motor bus operation leads to a proposal to eliminate

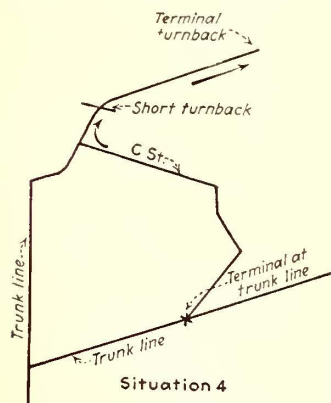
paving and other burdens if the track is retained, so much the better. The progressive management cannot lose either way by any plan that puts the two methods on a fairer basis of comparison.

SITUATION 3—ANOTHER CROSSTOWN ROUTE

Situation 3, which may be called A Street, resembles the M Street situation in being a cross connection between two trunk lines. However, it is only 0.6 mile long and almost all of its traffic flows toward one of the trunk lines mentioned. Through service is given, but as the distance to the trunk line is short and as the through cars on this route take a rather circuitous route in going to the city most of the residents of this district walk to one or the other of the trunk lines when going to the business district. When the time approached for retracking and repaving the estimates proved to be as follows:

Estimate of cost for rebuilding existing double track with 7-in. girder rail, repaving with recut granite, grouted joints and concrete base on A Street		
Special work for turnout.....		\$2,000
6,500 ft. 7-in. girder rail.....		22,750
3,325 treated ties.....		6,650
6,650 ft. track laid ready for paving, stone ballast.....		13,300
Teaming, watching, etc.....		2,500
Removing 6,650 yd. existing granite paving.....	\$2,660	
Removing 6,650 yd. existing track.....	1,665	4,325
		\$51,525
Plus 20 per cent.....		10,305
		\$61,830
Less credit for scrap material.....		3,990
		\$57,840
Add		
266 M recut granite blocks.....	\$5,320	
6,650 sq. yd. concrete base, furnished and laid in track and brows, teaming, etc.....	9,975	
6,650 yd. paving, ditto.....	9,310	
	\$24,605	
Plus 20 per cent.....	4,921	\$29,526
Total cost.....		\$87,366
Alternative estimate covering five-year rehabilitation for same location.....		\$72,800

A factor which affected the situation was that this part of A Street was a vital part of the positive and negative feeder distribution system, serving as a tie between two operating districts. Therefore, if the rails, trolley wires and feeders were removed because of bus operation, it would be necessary to furnish equivalent copper at an estimated cost of \$11,000.



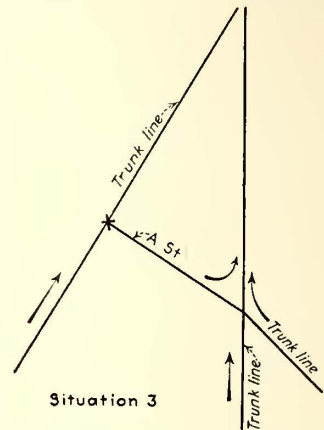
Examination of the operating statistics showed that the number of car-miles run on the 0.6-mile section of A Street was but 40,000 a year, or 114 miles per week day. The normal headway was fifteen minutes and the rush-hour headway ten minutes. Only 500 people a day used the service within this part of the run. Consequently two buses during the rush hours and one bus during the other hours would meet all shuttle service requirements. The relative over-all cost was then worked out as follows:

Situation 4 (C Street) relates to a third type of cross connection through almost desert territory. The round-trip runs are 4 and 3 miles respectively, according to where cars are turned back on one of the trunk lines intersected. Only 1/2 mile or so of the cross-connection is built up and paved, the rest of the run passing through swamps and an oil and gasoline storage district that offers no hope for future traffic development. Through this section the only paving is the granite strip put down by the railway and used cheerfully by all the tank motor trucks going to and from the storage district. The city will have to pave all of this road sooner or later. The two-man cars on this route operate only 99,000 car-miles a year, with an average of only 1.05 revenue passengers per car-mile. Even with the inclusion of transfer passengers, there are less than two passengers per car-mile. The crew expense alone is more than double the total revenue. On a typical week day 300 car-miles were run for 491 patrons.

Cost of track and paving renewals.....	\$87,366
Investment charge on same at 8 per cent a year.....	7,200
Investment charge per car-mile operated, on basis of 40,000 car-miles per annum.....	18 cents
Although this route is run with safety cars, this tremendous increase in overhead would make the over-all cost per car-mile at least.....	45 cents or \$18,000
The outside cost of two twenty-five-seat all-steel buses at \$8,000 each, plus \$11,000 for new feeders and \$7,718 net cost of track removal, is in new money.....	\$34,718
Or per bus-mile (40,000 miles) per annum.....	8.7 cents

Assuming twenty-five-seat motor bus operation to cost, say, 45 cents, instead of 40 cents per bus-mile because of unusually high overhead to be charged against it, we still break even. In this case, then, the railway would have to find only \$34,718 instead of \$87,366 in new money, the difference being made available for more productive uses than retracking and repaving this kind of location.

It has been stated that this route actually handled more passengers en route on the overlapping section of its run than it did in its own territory. So the question arises as to how to take care of these strictly trunk-line passengers. Inasmuch as this trunk line is already served by two routes, it was suggested that, instead of shortening the A Street route, it be abolished entirely, because any extra carrying capacity desired could be obtained by running somewhat larger cars and some more mileage on the two regular trunk-line routes or on only one of them.



Without going into detailed explanations, it may be stated that the net result of eliminating the A Street route entirely would be to save 99,000 car-miles per annum, the difference between the 160,000 miles actually run on the overlapping section and the 61,000 car-miles which would have to be added to one of the trunk-line routes. At 45 cents per car-mile the saving of 99,000 car-miles would be \$44,500 per annum.

Thus this particular study developed a condition where the replacement of cars by buses makes easier the elimination of wasteful, overlapping mileage, and so leads to greater savings than if no rerouting, but simply a direct replacement of car by bus, had been considered.

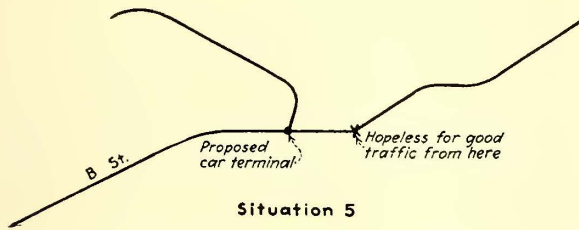
It may be of value to add that if the buses were to duplicate the present A Street route for its full length the result would be a loss instead of gain, even after taking into consideration the track reconstruction cost of part of the route as detailed.

SITUATION 4—ANOTHER EXAMPLE OF REDUCING LOSSES

Situation 4 (C Street) relates to a third type of cross connection through almost desert territory. The round-trip runs are 4 and 3 miles respectively, according to where cars are turned back on one of the trunk lines intersected. Only 1/2 mile or so of the cross-connection is built up and paved, the rest of the run passing through swamps and an oil and gasoline storage district that offers no hope for future traffic development. Through this section the only paving is the granite strip put down by the railway and used cheerfully by all the tank motor trucks going to and from the storage district. The city will have to pave all of this road sooner or later. The two-man cars on this route operate only 99,000 car-miles a year, with an average of only 1.05 revenue passengers per car-mile. Even with the inclusion of transfer passengers, there are less than two passengers per car-mile. The crew expense alone is more than double the total revenue. On a typical week day 300 car-miles were run for 491 patrons.

In place of the 99,000 car-miles per annum, it has been suggested that the company operate 72,000 bus-miles, giving an equivalent service on C Street itself, namely, 2.7 miles round trip, instead of running up any part of one of the intersecting trunk lines. A twenty-five-seat bus would be more than ample, and two of this size would be enough to maintain the present fifteen-minute headway.

The only investment items chargeable against the motor bus in this case comprise the price of two twenty-five-seaters, say \$16,000, and the eventual charge of \$11,000 for replacing the rail return with other negative feeder—a total of only \$27,000 new money, of which it would not be necessary to use more than \$16,000 at once. Because of the conditions obtaining on this



street, the rail might remain in place purely as a return circuit until such time as the street is repaved.

In contrast with this sum, the \$27,000 new money that bus operation would entail (aside from eventual removal cost of track, etc.), is the company's way department estimate that the cost of retracking and repaving of this 8,400 ft. double track would amount to a total of \$160,000.

SITUATION 5—POSSIBLE ELIMINATION OF UNPROFITABLE EXTENSION

This case differs from the foregoing in that it relates to the possibility of replacing a thin-traffic terminal section by means of a motor bus shuttle instead of paying heavy expenses incident to the widening of a street. The portion to be widened is practically one-quarter mile long and is in good territory, but the district for the remaining 0.85 mile of this route is hopeless from a traffic standpoint for topographical reasons. It is therefore a question as to whether it would not be more economical to terminate the car line at the point where the street widening is to begin and to handle the trifling traffic for the 1.10 miles beyond by means of a shuttle bus.

For convenience, the whole route may be referred to as B street. On inquiry it was found that if the track and line on the last 0.85 mile were removed now the company would have to spend \$15,410 net owing to the requirement of restoring the paving, but if it waits until the paving is renewed in the course of time by the city the net outlay would be only \$1,460. To summarize the actual cash outlay in each proposition, it was determined that the company must either lay out at once \$29,934 cash for the street widening project or pay \$14,000 for two sixteen-seat buses plus \$1,460 at some time in the future.

As regards the number of people to be served by the buses on the last 0.85 mile, the "on and off" traffic records showed that out of 540 outbound riders on a business day, 240 were in the first quarter mile and but 180 in the last section of 0.85 mile. Of inbound riders, only 224 got aboard in the 0.85-mile section and 326 in the quarter mile adjoining the proposed terminus of the

shortened car line. This traffic, or even twice as much, could be handled with one bus during the off-peak hours. A second bus could go on for three, four or more hours as experience would dictate.

In view of the few stops required, the single bus used all day should make four round trips of 2.2 miles each, or 8.8 miles an hour, readily. It, or the relief bus, would make, say, 160 miles a day or 58,400 miles per annum. With rush-hour supplementary mileage, the total might be placed at 65,000 bus-miles per annum in place of the 60,823 car-miles it was suggested to remove. The comparative costs would then work out as follows:

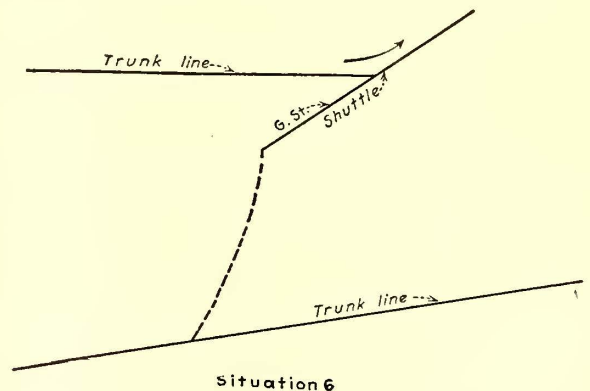
60,283 car-miles at 45 cents per car-mile.....	\$27,127
65,000 bus-miles at 40 cents per bus-mile.....	26,000

Even if the cost of car operation over all, because of safety car service, is taken at 40 cents, in contrast with the 50 cents over-all cost of the whole system, car operation would still cost as much as bus operation per vehicle-mile. Should the bus operation be debited \$15,410 for removal of track and line, etc., the added investment charge of \$1,233 would be on the basis of 65,000 miles a year operation, or only 1.9 cents. However, in practice, a higher bus cost might not appear at all because of the high figures assumed for small-number bus operation in these estimates.

SITUATION 6, G STREET—BUSES FOR A "ONCE-WAS" TRACKWAY

Once upon a time, as in the fairy stories, a suburban railway system had come into the city's outer territory via 1.3 miles of open track construction to make a cross-town route long before there was any semblance of a town in that territory. Eventually, 0.46 mile of this 1.3 miles was taken up. Today the district is still sparsely settled, but the dwellings already built give promise that it will be a high class suburb within the next two or three years.

The city now intends to pave what we will call G



Street for the entire 1.3 miles, including the 0.8 mile vestigial track operated by the city railway as a safety car shuttle. The cost of extending this shuttle 0.46 mile so that it will intersect with a trunk line at each end plus the cost of paving obligations works out as shown in the following statement:

NINE-INCH GIRDER RAIL CONSTRUCTION	
No ballast unless actually required, concrete paving base and 5-in. grouted blocks with granite joints:	
Trackwork.....	\$25,710
Overhead construction.....	2,700
Paving and base.....	14,500
	\$42,910

From a study of the traffic statistics, the following set-up was derived:

COMPARISON CAR VS. BUS, G STREET	
Present car operation, fifty-three round trips of 1.624 miles each daily.....	86.1 miles
Annual car-miles.....	31,426
Passengers carried on weekdays, approximately.....	200
Cost of future operation if line is extended to other trunk line, making the round-trip distance 2.54 miles.	
Annual car-miles on basis of three round trips an hour and 2.54 miles per round trip, approximately.....	50,000
Cost of the extension (0.458 mile) would be.....	\$42,910
8 per cent annual investment charge on this extension would be.....	\$3,432
Which is equivalent on 50,000-mile operation to a fixed car-mile charge of.....	6.8 cents
The investment charge per car-mile on two \$8,000 buses at 50,000 miles would be.....	2.56 cents
The over-all cost of 50,000 car-miles at 45 cents per car-mile would be.....	\$22,500
The annual over-all cost of operating these buses would be 40 cents × 50,000, or.....	\$20,000
Saving through motor bus operation, per annum, approximately.....	\$2,250

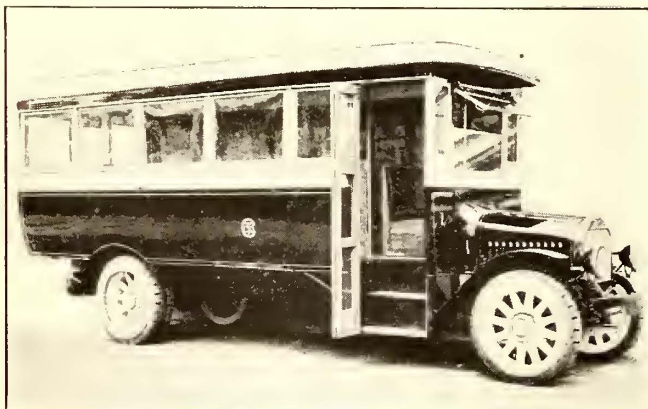
In conclusion, it may be pointed out that when the original full-length route was in operation the passengers, few as they were, insisted upon through service so long as they saw a track connection. Should motor buses be operated, shuttle service will be considered a matter of course, thus preventing the return to wasteful, through operation.

## Bus Route for Pennsylvania

Traction Company Finances Supplemental Motor Bus Company to Operate Between Oil City and Franklin to Meet a Popular Demand—Operation Started July 15

A RATHER interesting motor bus service supplementing existing trolley lines was inaugurated on July 15 by the Citizens Transit Company with a twenty-five-passenger Mack-Brill bus.

The Citizens Traction Company furnishes local and interurban service in and between Oil City and Franklin, two cities 8½ miles apart on the Allegheny River in the northwestern part of Pennsylvania. The entire country between these two cities is very mountainous, and on account of the rugged contour the electric railway company found it necessary to follow the ravines and valleys to find an operative grade. This made necessary a line 12 miles long in order that through service might be furnished between these two cities. The shortest route, however, lies along the banks of



EXTERIOR OF MOTOR BUS, SHOWING ENCLOSED STEPS OF CONVENIENT HEIGHT

and operation so hazardous that service on this 1½-mile link was ultimately discontinued. This left two short routes, one between Oil City and Reno Village and the other from Franklin east to Rocky Grove.

In December, 1920, a concrete highway constructed on an easy grade was completed from Reno Village to



INTERIOR OF BUS LOOKING FORWARD

Franklin, a distance of 4½ miles, on the north bank of the Allegheny River. With the completion of this road the Citizens Traction Company met a popular demand for service along this shortest route by the operation of its cars from Oil City to the village of Reno and connecting with the recently inaugurated bus route from Reno to Franklin, the latter service being conducted by the Citizens Transit Company, incorporated for the purpose, as the Citizens Traction Company's charter did not include railless operation.

The bus is scheduled to make one round trip per hour connecting with the Oil City-Reno cars at Reno and the local lines in the heart of Franklin. The through fare on the combination bus route between Oil City and Franklin is the same as has heretofore been charged, namely, 32 cents by cash fares or 30 cents by tickets.

The body is the Brill design for this capacity of bus and is mounted on a Mack 2-ton chassis, model AVDR, of the International Motor Company. The underframe is of composite construction and the body of wood sheathed on the outside with No. 18 sheet steel. The two-leaf folding doors are manually operated from the driver's position and inclose the double stationary steps. There is also an emergency door in the center of the rear end of the body, which is glazed in the upper portion, conforming to the rest of the construction. An outstanding feature of the body design is the use of single drop sash. This permits lighter roof construction and, consequently, lowers the center of gravity.

The interior finish is of ash with top carlines showing. Agasote is used on each side below the windows. Seating accommodations are provided by five Brill "Waylo" stationary type seats on each side of the aisle and a seat extending across the rear end of the body for five passengers. The section of this seat in front of the emergency door is removable. All transverse passenger seats have backs and cushions of the spring type upholstered in cane. The driver's seat is upholstered in leather.

It is a significant point to note that the management

the Allegheny River, and there was at one time a line connecting the two cities along the north bank of the river. However, for 1½ miles of this distance the hills rise abruptly from the riverbed, so that the electric railway lines necessarily had to be built on heavy grades, a construction which proved to be exceedingly difficult

does not expect an increase in revenue from this bus installation, since much of the traffic will undoubtedly be diverted from the through electric railway service furnished via Monarch Park, a distance of 12 miles.

### Electric Railways Operating Motor Buses

ACCORDING to a census of automotive equipment recently taken by the ELECTRIC RAILWAY JOURNAL there are twenty-five electric railway companies in the United States that are today operating passenger motor buses. These companies either own or control the operation of 128 motor vehicles and four trailers which represent an investment of approximately \$495,000.

There seems to be only one type that predominates, namely the 20 seat vehicle, of which there are 27, with the 17 passenger second with 21 vehicles. The 16 seat vehicle is third in favor with 17 and of the 12 passenger type there are 16. There are eleven 30-passenger bodies and ten that have a seating capacity of 18.

The prepayment system of fare collection is used in the majority of instances, the exception being the Pacific Electric Railway, Los Angeles, which uses both the prepayment system and the Ohmer register; the Connecticut Valley Street Railway, Greenfield, the Rooke register, and the Escañaba Power & Traction Company, the overhead register. The method of fare collection is not specified by the Bakersfield & Kern Electric Railway, San Francisco Municipal Railways, Dubuque Electric Company, St. Joseph Railway, Light, Heat & Power Company and Lincoln Traction Company.

The accompanying table shows the seating capacity, the year of purchase and the kind of tires used.

### Buses Do Large Business

Statistics from Pacific Coast State Show that One Dollar of Investment Earns Three in Revenue per Year—Margin of Profit Not Large

AN OUTSTANDING feature of recent development in the motor bus business in California is the consolidation of companies in the interest of more economical and efficient operation. A typical case is the recent formation of an association in Stockton, whereby sixty cars formerly operated by a number of small companies and individuals, after more or less continuous competition over 280 miles of highway, have been put under a common administration which is expected to make material improvement in service and profits to owners. Combinations have been formed in both south and central parts of the state, and stage depots, where a number of lines have a common terminal, are becoming popular.

Records of the California Railroad Commission for the year ended Oct. 31, 1920, show that 350 motor bus passenger carriers reported for the year total receipts of \$6,856,161 and expenses of \$6,028,821. A total of 157 freight transport carriers, reporting for the same period, showed receipts of \$2,401,336 and expenses of \$2,292,889. The tables on page 320 give some weighted averages for the motor bus passenger companies affiliated with the Motor Carriers' Association of California and also for three individual typical routes.

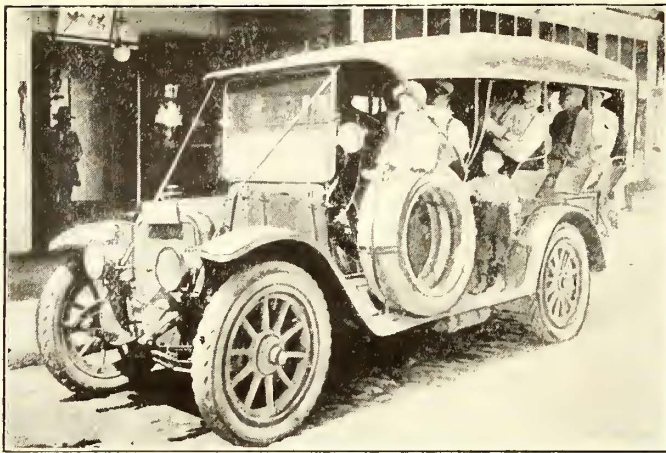
With improvement of operating conditions, better roads and more business, the type and style of passenger cars has been very greatly improved. The accompanying illustrations show a typical passenger car of a few years ago and the present modern semi-closed

DATA COVERING MOTOR BUSES OPERATED BY ELECTRIC RAILWAY COMPANIES (JULY, 1921)

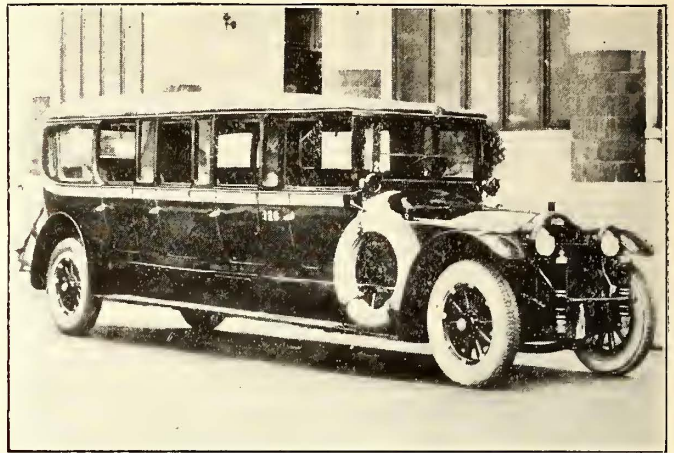
Name of Company	No.	Type	Year of Purchase	Seating Capacity (Each)	Capacity of Chassis	Tires	Name of Company	No.	Type	Year of Purchase	Seating Capacity (Each)	Capacity of Chassis	Tires												
<b>Arkansas</b>																									
Intercity Terminal Ry., Ar-genta.....	4	Mack	1915	20	2 tons	Pneumatic	Escanaba Pwr. & Trac. Co....	1	White	1919	14	.....	.....												
	3	Oldsmobile	1920	16	1 ton	Pneumatic																			
<b>California</b>							<b>Michigan</b>																		
Bakersfield & Kern Elec.R.R.	2	Studebaker	1918	12	.....	Pneumatic	St. Joseph Ry., Lt., Ht. & Pwr. Co.....	1	G. M. C.	1917	..	¾ ton	Pneumatic												
	3	Ford	1920	12	.....	Pneumatic																			
Pacific Electric Ry., Los Angeles.....	2	Case	1917	24	.....	Solid	<b>Missouri</b>																		
San Francisco-Oakland Ter. Rys.	2	Reo	1920	16	.....	Pneumatic	Lincoln Trac. Co. (not in use)	1	Oldsmobile	1920	12	.....	Pneumatic												
	4	White	1921	18	2½ tons	Pneumatic																			
Pacific Gas & Electric Co., Sacramento.....	1	Ford	1916	12	.....	Pneumatic	<b>Nebraska</b>																		
	1	Dodge	1918	14	.....	Pneumatic	Niagara Gorge Bus Line.....	1	White	1918	22	.....	Pneumatic												
	1	Dodge	1919	14	.....	Pneumatic																			
<b>California</b>							<b>New York</b>																		
San Francisco Municipal Rys	5	White	1918	30	.....	Pneumatic	Niagara Falls.....	1	Packard	1921	32	.....	Pneumatic												
	1	White	1919	30	.....	Pneumatic																			
San Jose Railroads.....	3	White	1920	30	.....	Pneumatic	<b>Oklahoma</b>																		
	1	Case	1916	16	.....	Pneumatic	Okmulgee Tract'n Company	6	Oldsmobile	1920	42	.....	Pneumatic												
	1	Ford	1919	12	1 ton	Pneumatic																			
Santa Barbara & Suburban Ry.....	3	Studebaker	1917	16	.....	Pneumatic	<b>Pennsylvania</b>																		
	3	G. M. C.	1920	16	.....	Solid	Citizens' Transit Co., controlled by Citizens' Traction Co., Oil City.....	1	Mack	1921	25	2 ton	Solid												
	1	Moreland	1915	16	.....	Solid																			
Stockton Electric Ry. Co.....	1	Moreland	1916	16	.....	Solid	Johnstown & Somerset Ry...	1	Packard	1921	22	.....	Pneumatic												
	1	Moreland	1917	32	.....	Solid																			
<b>Connecticut</b>							<b>Texas</b>																		
The Connecticut Company..	8	Reo	1921	12	.....	Pneumatic	Ft. Worth Auto Bus Co., controlled by Northern Texas Traction Co.....	8	White	1917	20	.....	Pneumatic and Solid												
	3	Packard	1921	27	.....	Pneumatic																			
<b>Iowa</b>							<b>Washington</b>																		
Dubuque Electric Company.	3	.....	1918	15	.....	.....	Seattle Municipal Ry. Co....	1	White	1919	20	.....	Pneumatic												
<b>Maryland</b>														1	White	1919	20	.....	Pneumatic						
Baltimore Transit Co., controlled by United Rys. & Elec. Co., of Baltimore..	20	White	1917	17	.....	Solid*														1	Garford	1920	18	.....	Pneumatic
<b>Massachusetts</b>							1	Garford	1919	40	.....	Pneumatic													
Bay State System.....	1	Garford	(a)	30	.....	Pneumatic																			
	1	Reo		20	.....	Pneumatic																			
	1	Oldsmobile		20	.....	Pneumatic																			
Connecticut Vy. St. Ry., Greenfield.....	3	Cadillac	1919	20	.....	Pneumatic	Milwaukee Elec. Ry. & Lt. Co.	8	Reo	1919-20	20	.....	Pneumatic												
Holyoke Street Ry.....	2	Reo	1921	16	.....	Pneumatic																			
	1	Internatl.	1921	16	.....	Pneumatic																			

\* On Sewell Cushion Wheels.

(a) Operated on contract basis for railway company.



TYPICAL EARLY TYPE MOTOR BUS OPERATED IN CALIFORNIA SERVICE



TYPICAL PRESENT DAY TYPE OF SEMI-ENCLOSED BUS NOW IN EXTENSIVE USE

bus of a type being used in many parts of the state. Today bodies are built with the idea of giving a maxi-

mum amount of comfort to the passenger. As will be noted the appearance is good and an endeavor has been made to follow the best practice in stream lining.

ANALYSIS OF PASSENGER TRANSPORTATION COSTS—MOTOR CARRIERS' ASSOCIATION OF CALIFORNIA—YEAR ENDED DEC. 31, 1920

	Actual	Unit	Item
Number of companies	7		
Mileage of highway used	1,182		
Passenger cars	196	Per mile highway	0.1656
Total seating capacity	2,671	Average per bus	13.6
Bus-miles operated	11,430,061	Per mile highway	9,690
Passengers carried	4,315,874	Average per bus	58,400
		Per mile highway	3,660
		Per bus-mile	0.379
		Per mile highway	\$1,820
Passenger revenue	\$2,149,541	Per bus-mile	18.8c
		Average fare per passenger	48.7c
Operating expenses	\$2,319,135	Per mile highway	\$1,965
		Per bus-mile	20.35c
Taxes and licenses	\$19,868	Average per bus	\$101
Liability insurance	\$72,839	Average per bus	\$372
Investment	\$776,315	Average per bus	\$3,970

NOTE.—There are a total of eighteen companies in the passenger motorbus transportation service operating over 3,400 miles of highway, and having available for service 412 vehicles capable of seating 5,603 passengers. Only seven furnished complete information as shown above.

ANALYSIS OF OPERATING COSTS—TYPICAL PACIFIC COAST BUS ROUTES

	Motor Transit Company, Los Angeles (a)	Per Bus-Mile	Western Motor Transport Company, Oakland (a)	Per Bus-Mile	Tacoma (Wash.), Olympia Stage Line (b), Actual	Per Bus-Mile
Traffic per month average	300,000					
Maximum mileage per month per bus	9,000					
Average monthly bus-mileage	505,000		70,000		29,096	
Passenger revenue	\$114,000	27.60	\$27,500	39.25	\$7,836	26.95
Costs of Operation:						
Fuel					618	2.12
Oil	\$13,290	2.63		3.00	69	0.24
Tires	15,507	3.06		3.50	528	1.82
Repairs (parts and labor)	19,387	3.80		4.70	(c) 125	0.43
Depreciation				3.00	1,250	4.30
Miscellaneous					115	0.39
Drivers	19,051	3.77		3.50	1,156	3.98
General superintendence					350	1.20
Other expenses	35,000	6.92				
Insurance				1.00	166	0.57
Rent				1.50	50	0.17
Printing and advertising				1.00	100	0.34
Office expense				2.00	200	0.68
Total	102,235	20.22	16,240	23.20	4,727	16.24
Taxes and licenses					44	0.15
Interest at 7 per cent					300	1.03
Surplus					2,765	9.53
No. of motor buses					7	
Type of machine	White		White		White	
Model					15	
Seating capacity					14	

(a) Figures for May, 1921. (b) Figures for September, 1920. (c) Estimated.

The low type chassis and body are now coming into favor as it seems to have been pretty well established that a lowering of the center of gravity results in a saving on tires and adds materially to the safety of operation.

### Detroit Trolley Buses

Bids Asked for Trolley Buses that Can Easily Be Converted Into Gas-Driven Units—To Have All-Steel Body Seating Twenty-Nine Passengers

THE Department of Street Railways of the city of Detroit has recently asked for bids on fifty trolley buses. Ten of these are for immediate delivery, but the others are not to be delivered until the first lot has been tested in service and any changes shown necessary in such operation have been agreed upon. Mention was made in the ELECTRIC RAILWAY JOURNAL for July 2, page 37, that the city was considering the use of this type of vehicle for supplementary service with existing rail lines.

The specifications provide that the chassis must be built to accommodate either electric motors or gas engines, so that in case operation of the trolley bus proves unsuccessful the vehicles can be easily converted into motor buses. Each bus is to seat twenty-nine passengers and must weigh light not less than 9,000 lb. and be capable of transporting a load of 7,500 lb. With these buses it is proposed to maintain a minimum scheduled speed of 8.5 m.p.h. with nine stops per mile and an acceleration of between 1½ and 2.0 miles per hour per second.

The specifications call for a metal body of the truss side type with structural steel angle sills formed to the shape of a wheel housing over the rear axle. Pressed steel posts and letter board are to be used and the roof is to be made of wood or Haskelite so that persons can be supported thereon without damage to the roof. Two trapdoors are to be put in the floor of the bus, one to be over the rear axle housing and the other over the motors. An entrance and exit door is called for on the right hand front side. It is to have about 26 in. clear way. The doors fold outward and are of the two-panel jackknife type and are operated by ball bearing, National Pneumatic Company's hand lever control. In the rear there is an emergency door controlled by an electric lock



under glass which when broken releases the lock and allows the door to be opened. The windows are of the raised sash type and push up so as to give 12-in. clearway. The inside finish is birch, stained mahogany color, and the roof above the sash white enamel. Lighting is obtained from six 23-watt railway lamps on two circuits. One circuit covers five interior lamps, while the other covers one interior lamp, two headlights, a step light and an illuminated sign light.

Miscellaneous fittings called for include two Nichols-Lintern tail-lights, a Faraday buzzer system, Cutler-Hammer 500-watt 296-volt single-unit truss plank

heaters, two of which are connected in series; Rex all-metal rollers, double coated curtain material and Curtain Supply Company's fixtures. Steel tubing is used as a railing to separate the driver from the passengers. An operator's mirror 22 x 8½ in. is located so that the operator can obtain a full view of the passengers in the bus. Three exhaust ventilators are located on the center line of the roof and are covered with metal shutters. Johnson type D fare boxes are conveniently mounted at the entrance.

The bids, which were opened Aug. 18, ranged from \$7,325 to \$10,500.

## New Track and How It Was Financed

The Gary Street Railway Finances Locally the Reconstruction of 1.8 Miles of Track Using Mechanical Ties to Reduce the Thickness of Concrete and Avoid Too Great Rigidity

**A**UTHORIZED by the Public Service Commission of Indiana to issue \$75,000 of first mortgage 5 per cent gold bonds for the purpose of reconstructing 1.8 miles of single track on Broadway, the main street of Gary, Ind., the Gary Street Railway set out to dispose of these bonds through the usual channels. President Charles W. Chase went east to dispose of the bonds there, while T. G. Hamilton, superintendent and purchasing agent, went to Chicago to see what could be done in that city. Both returned to Gary unsuccessful. But having faith in the merit of the securities offered and confidence in the future of Gary and its street railway property, they determined to dispose of these bonds locally.

A plan was evolved to first interest the employees in purchasing these bonds and then, having won their active interest, to endeavor to sell bonds to the public through the employees. Since the total outstanding first mortgage obligations of the company are only \$375,000, including the present issue, whereas the value of the property as recently established by the Public Service Commission is \$1,800,000, exclusive of good will or any franchise values, the officials felt perfectly safe in inducing the employees to invest their savings with the company.

A letter setting forth the details was addressed to each employee and he was invited to buy as many bonds as he could for \$85 cash, or \$87.50 payable in ten months; that is, \$4.37 from each semi-monthly pay, per bond. While the management has felt that it was very close to its employees, the response that came to the offer of bonds was a surprise even to them. Of the trainmen, 96.3 per cent bought from one to five bonds, while 76 per cent of the shopmen, 37.7 per cent of the trackmen, 57.5 per cent of the salaried employees and 68.1 per cent of the linemen also purchased one or more bonds. Altogether, of the

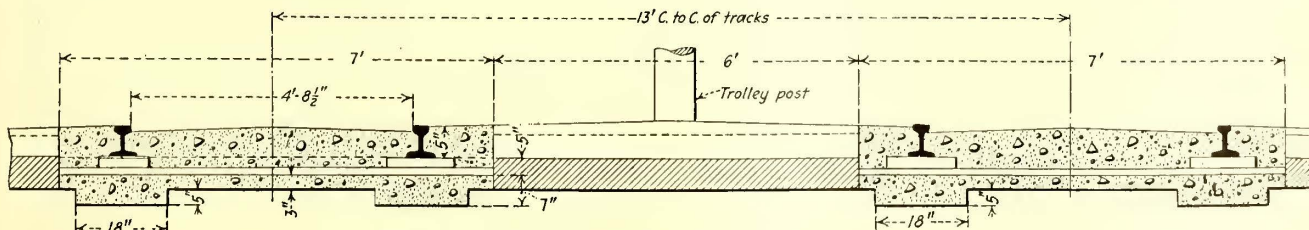
272 employees, 201 or 74 per cent, bought bonds, the total amount subscribed being about \$35,000.

The assistance of the employees was then secured in disposing of additional bonds to the public, to whom they were offered at \$90, the employee making the sale receiving a commission of \$2.50 for each \$100 bond sold. Through them and the efforts of the officials direct, an additional \$25,000 of bonds were disposed of to the public. Some of the local materials dealers from whom materials used in the track construction were purchased, accepted some of these bonds in part or total payment. The names of the merchants who purchased bonds were posted in the carhouse so that the trainmen and other employees might know who was helping to support the street car company and incidentally them.

The employees seemed to take a great interest in this proposition and a number of them who could not purchase a bond came in to see the superintendent and tell him they were sorry they were not in a position to take a bond just then. At the time of this writing more than \$60,000 worth of the bonds had been disposed of so that the necessary money for the new track was assured and construction work was well under way.

### TYPE OF TRACK REPLACED

The track that is being replaced was built in 1907, shortly after Judge Gary established the new city among the sand dunes at the south end of Lake Michigan. It was laid with 60-lb. A.S.C.E. T-rail on oak ties directly on the sand, no other ballast being used. A concrete curb was built along either side of the 26-ft. trackway through the center of the broad street so that the sand was there confined. Simple four-hole angle bars were used to make the joints. This track has been subjected to a four-minute headway of local street cars all day, with a one and one-half-minute headway



CROSS-SECTION OF TRACK CONSTRUCTION SHOWING CONCRETE BEAM UNDER EACH RAIL

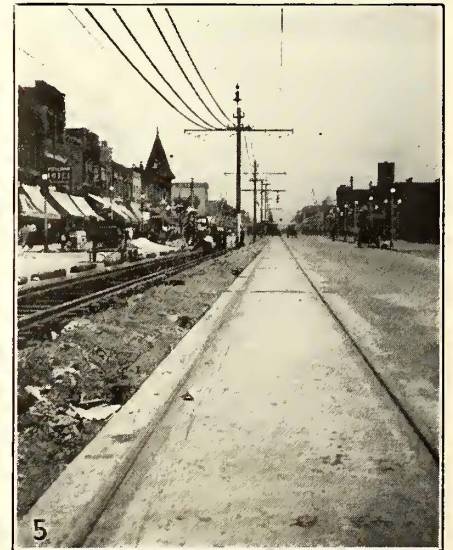
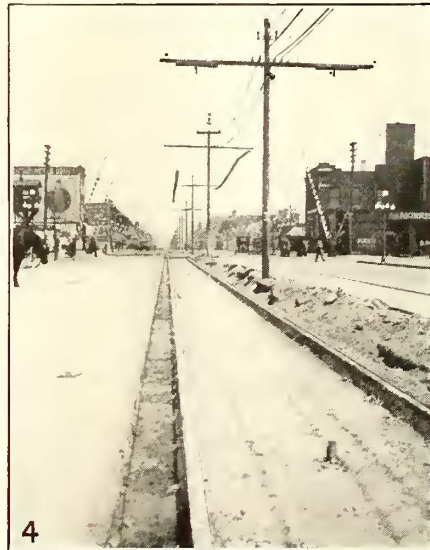
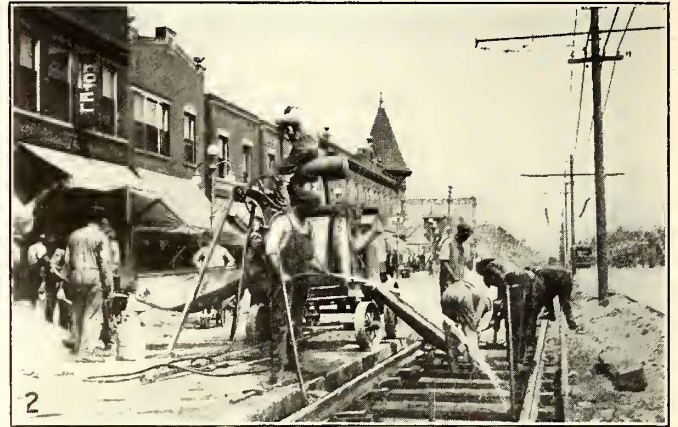
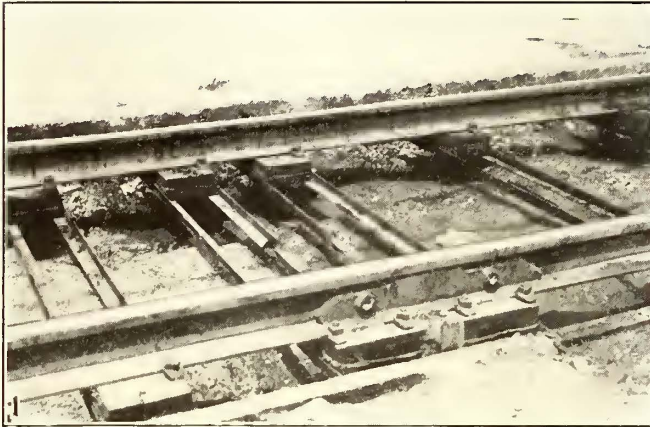
during the morning and evening rush, and in addition has carried the cars of the Gary & Southern, the Gary & Valparaiso and the Gary & Hobart interurban lines which have operated over it hourly. Many of the ties are still good and are being reused on one of the interurban lines.

#### MECHANICAL TIES EMPLOYED IN NEW TRACK

The new type of track now being built is of solid concrete construction, including the paving, and employing Dayton mechanical ties, Indianapolis apex electrically welded joints and 90-lb. A.R.A. T-rail of Illinois Steel Company section 9020 rolled in 66-ft. lengths. Several reasons were involved in the selection of these

paving desired by the city at practically no greater expense than a good construction using wood ties and employing a less permanent paving. Furthermore, the use of these special ties provided a certain amount of resiliency which was considered highly desirable when going to an otherwise rigid construction, the reduction of noise being a factor in this case also.

An accompanying drawing shows a cross-section of the track, from which it is seen that the concrete foundation was poured practically in the form of a beam under each rail. The surface of the trench was prepared so that the thickness of concrete along under the rails was about 7 in. under the ties and this was narrowed up to about 3 in. in the middle of the track.



#### VARIOUS STAGES IN THE CONSTRUCTION OF TRACK IN GARY

No. 1—Construction at the joints where special joint tie and electrically-welded plate are used. Excavation under the ties at the rails to form longitudinal beam can also be seen.

No. 2—Pouring in the first layer of concrete. The sand soil is first packed down by wetting in advance of the concreting by means of a hose.

No. 3—Rail and ties assembled and subgrade excavated ready for pouring foundation concrete.

No. 4—Pouring of the concrete base carried up even with the tops of the ties completed.

No. 5—Appearance of the completed track showing expansion joint locations in the distance.

mechanical ties for use in this track. Because the local city authorities were making extensive use of concrete paving, it was highly desirable that the street railway should use the same type of pavement so that the street would be uniformly surfaced. The use of mechanical ties with the concrete foundation and paving construction reduced the thickness of concrete required by such an amount that this saving, taken in conjunction with the greater spacing of ties and the minimizing of labor in assembling, made it possible to build this type of track employing the concrete

After the rails and ties were assembled, the track was blocked up to grade and alignment and the concrete poured up to the level of the base of the rails. This was allowed to set and thereafter the paving layer was poured and the whole structure allowed to cure three weeks before traffic was permitted over it. In adopting this more permanent type of construction an agreement was reached with the city whereby the width of street to be paved by the company was reduced from 26 ft. to 20 ft.

The rails were supplied in 66-ft. lengths and drilled

with one hole at each end, used to hold the joint plate in position until welded. The use of this extra long rail and the absence of any drilling of rails or boring of ties minimized the amount of labor required on the job. A brace and socket wrench were used to set up the four bolts and clips on each mechanical tie. The joints in the rails were staggered and a special Dayton mechanical joint tie used at each joint. The two adjacent ties were spaced at 2-ft. centers from the joint tie and the remaining ties at 3-ft. centers. At the joints, the bond was formed by the welding of the Apex plate to the rail and the welding of the rail base to the tie plates. Cross-bonds were provided every 800 ft. by welding old 60-lb. rail, inverted, across underneath the base of all four rails of the two tracks. One of these cross-bonds was installed at either side of each railroad crossing and the two cross-rails then bonded together with a 5,000-circ.mil cable extending through the crossing and welded to the cross-rail on either side.

An expansion joint was provided every 40 ft. in the upper or pavement layer of concrete. These joints were made by inserting in the opening two strips of 6-in. x  $\frac{3}{8}$ -in. elastite projecting above the surface of the pavement about 2 in. The two strips were then hammered down into the opening and one strip bent over either way, filling the surface completely and smoothing over the separation between sections so that the joint is not felt by passing vehicles.

In 1920, the Gary Street Railway carried 11,270,503 passengers and operated 1,930,000 car-miles. The rate of fare is 8 cents cash or fourteen metal tickets for \$1, and six school tickets for 25 cents. In the month of May, 1921, 74.3 per cent of the passengers paid cash, 23.4 per cent bought tickets and 2.3 per cent rode on school tickets. In June the corresponding tickets were 69.5 per cent cash fares, 28.7 per cent ticket fares and 1.8 per cent school tickets. Despite the fact that the car lines cross seventy-two railroad tracks at forty-one locations, the average schedule speed of the safety cars used is 8.1 m.p.h. The total city system comprises 31.4 miles of single track. Normally the company carries about 40,000 passengers every week day, but at the present time, due to the slack business at the steel mills, the daily number of passengers is around 25,000. The safety car earnings run from 42 cents to 58 cents per car-mile on week days with seven to eleven passengers per car-mile. These figures are for the month of June, 1921, which is the lowest month in point of traffic that the company had had up to that time.

The double-truck Peter Witt type cars are earning from 46 cents to 76 cents per car-mile and carrying 6.9 to 10.8 passengers per car-mile. The wages paid to trainmen, most of whom have been with the company six or seven years or more, is 71 cents maximum for two-man cars and 76 cents for safety cars. The monthly operating ratio during the last six months has varied from 65 to 74 per cent, the latter having prevailed in June.

The Milwaukee Electric Railway & Light Company is equipping all its interurban cars with Miller trolley shoes. It has been using some of these shoes for a long time, but has found that they give a better life if all cars on a line are equipped with shoes rather than to have some trolley wheels mixed in. The wheels seem to pit or burr the wire slightly, producing a rough surface which makes the wear on the shoes more rapid.

## Saginaw Service Still Suspended

Prospect for Resumption by Railway Appears Remote—  
Each Succeeding Day Drives Home the Inadequacy  
of the Bus

SAGINAW and Bay City entered, on Aug. 24, their third week without electric railway transportation and little is known when there will be a resumption of service. Otto Schupp, the receiver for the Saginaw-Bay City Railway, is out of the city, and company officials profess to know nothing of what the future holds for the two valley cities.

One jitney accident, in which five persons were seriously injured, and a near accident have awakened the members of the Council to the fact that the operators of jitney buses must provide adequate insurance for the protection of the riding public. Mayor B. N. Mercer has taken the stand that unless operators do this, he will fight to the end that the jitneys must cease operations. Commissioners Holcomb, Johnson and Hammel are with him in this attitude, but Commissioner Phoenix, who has at every opportunity taken



TYPE OF VEHICLE AT DEPOT GREETING VISITORS

a position against the railway, wants to require only a small policy, saying, "I will not vote for any insurance which will drive these people off the streets."

This commissioner never would help the company and at an informal meeting of the Council and the bus operators, urged that they be allowed to charge 1 cent for a transfer to "help them along." He has introduced in the Council an ordinance for the regulation of the buses and while seeming to insist upon strict measures, any time the question of the amount of insurance to be required from each owner comes up, he backs up and stands as the friend of the bus owner.

At the present time there are fifty buses operating under a go-as-you-please schedule. As a result during rush hours there is an entire lack of accommodations for the public. In fact the only time a person is reasonably sure of having a seat is the middle of the forenoon. Double fares are being charged, as no satisfactory arrangement has yet been worked out for issuing transfers. The jitney men say "just as soon as the ordinance is passed and if we can work under it then we will issue the transfers."

No figures are available, but it is freely stated that probably not more than twelve of the bus operators own their vehicles. Citizens generally know them to

be irresponsible from a financial standpoint. In political circles, Commissioner Phoenix is given credit for wanting to frame a strong ordinance, with the exception of the insurance section. When the buses fail under his rule it is expected he will urge that the question of municipal ownership of the railway be submitted to the people. Since he has been in the Council this has been his one big hobby. How far he will get of course no one knows, but there has never been any pronounced movement along this line.

To protect the city's interests, it is expected the



REO BUS WAITING FOR PATRONS

Council will notify the railway this week to operate its cars, and then as a matter of form will allow thirty days to elapse before declaring the franchise forfeited. What effect this will have on the situation is not known. The United States District Court is in charge of the property and how the company can do anything has not been explained.

The members of the Council with the exception of Commissioner Phoenix are not satisfied to forfeit the franchise and if the receiver decides to operate, with the jitney competition removed, it is expected that the Council will be glad to accept the proposition.

It is now well known that the jitneys cannot take care of the transportation needs of the city. Should manufacturing conditions improve they would be swamped. The last available reports on the labor situation showed only about 45 per cent of the normal number of workers employed.

Otto Schupp, receiver for the railway, announced on Aug. 24 that a rough inventory of the property now being made will be completed for submission to the United States District Court during the week ended Sept. 3. Until then no change is likely in the status of the case, Mr. Schupp said.

The Council has allowed two weeks for jitney owners to furnish insurance on each bus at the rate of \$5,000 for one person, and \$25,000 for one accident. Mayor Mercer held out for a \$50,000 policy, but was voted down four to one.

The president of the Fair Association appealed to the Council to allow the Michigan Railway to operate during fair week. The usual attendance at this event is 800,000, but members of the Council were not in favor of this proposal. Transportation to the fair will, therefore, depend largely upon the uncertain public jitneys. The Fair Association has a \$75,000 loss to meet this year.

The suspension of service and the receivership are the culmination of about two and a half years of almost continuous difficulty—tie-ups, strikes, court

actions and settlement proposals. They were the direct result of the action of the people in rejecting the franchise presented for consideration on July 19, last.

In all, there have been four suspensions of service since March 23, 1919, to the present. They totaled 37½ carless days with twenty-four days the longest suspension and two days the shortest. Three times the suspensions resulted from strikes for higher wages, which the company refused on the ground that it could not grant them without increased fares. Once, the first time, the company ran its cars into the carhouses in refusal to operate for the old 5-cent fare.

The election on July 19 came as a result of representations by the Saginaw-Bay City Railway to the Council that unless some provision was made for higher fares and relief granted from jitney bus competition and paying burdens, the company would be forced into bankruptcy.

In a series of conferences between city and company representatives the early part of June, the service-at-cost franchise was worked out. In asking for this conference, the company reminded the city of an agreement reached last November, when the cars started after their twenty-four-day tie-up, in which the Council agreed to take up consideration of a new thirty-year franchise and the other points on which the company asked relief.

The history of that tie-up goes back to last fall, when the motormen and conductors demanded a 50 per cent increase in pay, only to be told by the company that this was impossible unless the city granted an increase in fares.

After appealing to the Council for a 10-cent fare, which was rejected together with a compromise offer by the Council of an 8-cent fare, with tickets selling at five for 35 cents, the company offered another compromise: A 10-cent fare with tickets at four for 25 cents, but this was ignored by the Council.

The requests for higher fares denied, the railway officials refused the demands of the men, who then went on strike. The county fair was on at the time, and although the strike started technically on Sept. 30 the tie-up was postponed by an agreement between the men and the Saginaw County Agricultural Society by which the employees continued to run the cars for the three days remaining of the county fair week. They were paid by the fair society, which, in turn, was reimbursed by the company.

The following Sunday midnight the strike started. Developments came rapidly. The city went into Circuit Court and obtained a mandamus ordering the company to live up to its franchise, then had the officials cited for contempt of court when they failed to observe the court's order. The carmen reduced their wage demands to 10 cents an hour—about a 20 per cent increase. Then, without warning, and shortly after a conference between company officials and the Council, the company started the cars, giving the men the demanded increase.

Two weeks elapsed before the public learned the reason for this sudden resumption of service. Then the company, in a communication to the Council, disclosed the fact that it considered the Council had promised a higher rate of fare would be granted if service were restored, something all the members of the Council denied was done. The Councilmen asserted that they merely told company representatives they would not consider any rate proposition whatever until

the cars were running, refusing to treat with the company until service was restored, on the ground that the street railway heads were "outlaws" while they failed to obey the court's order.

Negotiations continued until Nov. 1, the men meanwhile receiving the wage increase they had asked. Then the men, refusing to accept a wage cut which the company announced would be necessary because of the Council's alleged failure to keep its agreement, struck again, starting the twenty-four-day tie-up.

The public utilities committee of the Board of Commerce took a prominent part in the negotiations that followed. It proposed a \$200,000 bond issue by the city to build extensions, and also proposed a fare increase to the company. These negotiations at first failed to produce results, as did efforts by the Federation of Labor to bring about adoption of the Plumb plan for controlling the railway.

The city went into court again, asking that the company be compelled to live up to its franchise and that its officials be punished for contempt of court. Circuit Judges E. A. Snow and Clarence M. Browne upheld the injunction which had been granted several weeks previously ordering the cars to run, and adjudged the officials in contempt of court. But before the contempt proceedings could be finished the company obtained a writ of certiorari from the Supreme Court, which operated as a stay of proceedings.

The cars remained idle despite the court's action in upholding the injunction ordering them to start. But meanwhile the Board of Commerce committee had been active, and in a conference on Nov. 23 an agreement was reached between the city, the company and the men by which the cars were started Nov. 25.

Under this agreement the men submitted to a wage cut which took them back to their wages before the October strike, while the Council agreed to regulate

ing to approve the 6-cent fare granted by the Council in July, 1918. This tie-up lasted five and one-half days, ending when the city went into Circuit Court and obtained an order compelling the railway to observe the provisions of its franchise contract.

The second suspension started July 25, 1919, when the company, operating at a six-for-a-quarter rate of fare, refused its men an advance in wages unless the 6-cent fare were restored. This fight the company won, restoring service July 31, after the Council adopted another 6-cent fare ordinance. The first ordinance granting this rate had been repudiated by the people, but the second, identical in every way, was approved by the people by a big majority in September, 1919.

## Tentative Settlement Draft Presented

In the Vernacular, Des Moines Is Still Walking, but Getting Nowhere—Presence of Mr. Harris in City Desired—Manager Chambers in Chicago

AFTER an eight-hour conference between F. C. Chambers, general manager of the Des Moines (Ia.) City Railway, and a special committee from the Retail Merchants' Association on Aug. 23, Des Moines seemed no nearer a solution of its railway difficulties than previous to Mr. Chambers' visit to Chicago. Mr. Chambers brought back a tentative draft of a new franchise prepared by the Harris interests, and while the details of the draft have been kept secret, it is understood that the main stumbling block will be the fare provisions, as retail merchants do not feel that an 8-cent fare franchise can be passed in Des Moines now.

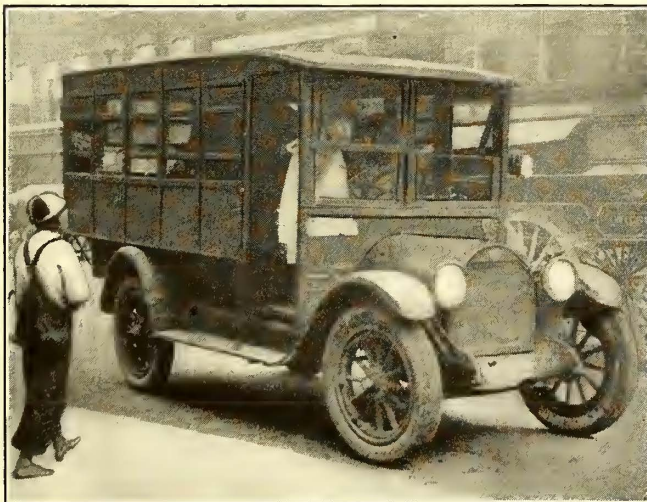
The immediate result of the conference was a request from the committee that Mr. Chambers return to Chicago and attempt to have A. W. Harris come to Des Moines personally to conduct the negotiations with the committee. Mr. Chambers has returned to Chicago but no announcement by him had been made up to Aug. 25.

Seven more bus licenses were granted by the City Council on Aug. 23 under an agreement that the vehicles would be allowed to continue operation until Sept. 2, which is the last day of the Iowa State Fair. All outstanding licenses expire automatically on Aug. 31. Ten more buses are said to be on the way from Kansas City and operators now claim that 106 buses are in operation. This the railway men deny.

Bus operators have started a campaign to sell the bus proposition to the city and called a mass meeting of all civic and commercial organizations with the City Council for Aug. 25. The Council accepted the invitation. This will be first of a series of meetings to impress upon the public the difficulties which buses have encountered.

Five touring cars are now being used from which to supervise and direct bus operation, and guards have been placed at railroad crossings for the first time. The operators have agreed to place all new buses arriving in the city on the fair grounds line and not to reduce service on other lines. It is claimed that twenty-five buses will operate on the fair grounds line. The fair started on Aug. 24, and for about five days it will be necessary to transport about 50,000 people a day.

City Councilman John Budd on Aug. 23 offered a preliminary plan for allowing the buses a three-year grant. He urged that a reliable corporation be granted a franchise and the present makeshift arrangement be abolished. Mr. Budd proposed a fleet of from 150 to 175 buses with a minimum seating capacity of twenty for each vehicle and a limit on seating capacity of thirty.



BUS AT CURB ABOUT TO DISCHARGE PASSENGERS

jitney bus competition and immediately to take up consideration of a new thirty-year franchise, the cars to run meantime at the 6-cent fare then in force. The franchise, which the Council on that date agreed to frame and to submit to the people, is the one which the voters so emphatically refused to accept on July 19.

But that series of troubles was not the first the city had experienced. The initial tie-up came on March 23, 1919, when the company suspended service as a protest against the action of the voters on March 5 in refus-

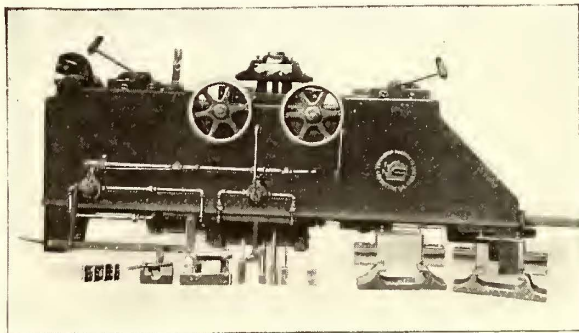
# Equipment and Its Maintenance

*Short Descriptions and Details of New Apparatus of Interest  
to the Industry. Mechanical and Electrical  
Practices of All Departments*

## Hose Dismantling and Assembling Machine

**A New Device—Cuts Clamp Bolts, Removes Nipples and Couplings and Assembles the Various Parts of Air, Steam and Signal Hose, Which Speeds Up This Work Considerably**

THE Covington (Va.) Machine Company, Inc., has placed on the market a new type of machine for dismantling and assembling air-brake, signal and steam hose. In addition to saving much time in performing this work, the use of the machine insures that all



MACHINE FOR DISMANTLING AND ASSEMBLING HOSE

clamps, couplings, nipples, etc., are not strained or distorted in the removal operation, so that they can be used again without danger.

The accompanying illustration shows the machine as constructed, together with the entire equipment of tools for performing the various operations. To remove the fittings from old hose, the first operation is to cut the clamp bolts. This is performed by a special shear knife located to the left of the machine in the illustration. The operator places the hose in position and by pressing down the pedal the bolts are cut without injury to the hose clamp.

The coupling and nipple are removed by a single operation. To perform this operation the hose is clamped in the central portion of the machine and the nipple and coupling pullers are dropped into position.

The pressure for clamping the hose is obtained by moving the lever shown at the right and by moving the lever at the center of the machine air is admitted to the pulling cylinder, which removes both fittings, together with the clamp from the hose without injury. The operation for stripping the various types of hose is the same, but different sized tools are used to suit the different types of hose.

To assemble the fittings the new hose is laid between two straight clamping blocks which are brought together by the air pressure in the clamp cylinder. These blocks hold the hose straight and without danger of injury. The coupling is held in the same fixture as is used for dismantling and the nipple is placed on a centering

fixture. The sliding heads which insert the fittings are brought together by moving the operating lever at the center of the machine to the left. The heads are then released and the hose clamps are brought together by means of the hand wheels and special jaws. The inserting and screwing up of the clamp bolts complete the operation.

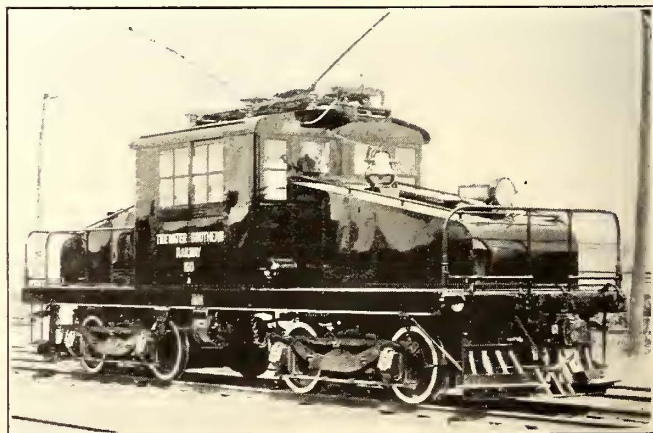
By the use of this machine it has been found that a single operator can readily dismantle 100 air hose per hour and assemble twenty per hour. The assembling operation is limited somewhat by the time necessary to screw up the clamp bolts, as this is the longest single operation in assembling.

## New Locomotive for Tidewater Southern Railway

FOR handling increased interurban freight traffic in the San Joaquin Valley between Stockton and Thurlock, Cal., the Tidewater Southern Railway, a subsidiary of the Western Pacific Railway, has recently placed in operation a new General Electric 60-ton electric locomotive embodying several interesting features.

Designed for operation at 1,500 volts direct current, the locomotive is 37 ft. 4 in. long, 9 ft. 7 in. wide, with a total wheelbase of 25 ft. 5 in. It is driven by four 750/1,500-volt box-frame, forced ventilated railway motors through a single reduction gear of 69:17 ratio. The motors are arranged for shunted field operation, which gives a continuous rating on 1,500 volts of 14,500 lb. continuous tractive effort at 22 m.p.h. It will operate at reduced speed on 600 volts. The control is type M, single unit with two master controllers giving ten steps with four motors in series and seven steps with two in series and groups in multiple. The motors are permanently connected in groups of two in series.

The motor rheostats and various parts of the control equipment are housed under the sloping end cabs,



1,500-VOLT LOCOMOTIVE FOR TIDEWATER SOUTHERN RAILWAY

conveniently arranged for inspection and repairs. Current is collected through two pole trolleys which will operate through a range of from 14 ft. to 22 ft. above the rail.

There is a main switch with a magnetic blowout for opening the main circuit in emergency, or for inspection, and a complete equipment of auxiliary switches for the control of headlights, cablights, dynamotor blower set, compressor and compressor relay, control circuits, heaters, field shunting and control transfer.

Headlights as well as cablights, control and compressor relay are operated from the dynamotor, except when the locomotive is being run on 600 volts, when they are operated from the trolley. There are two CP-30 air compressors with a combined piston displacement of 70 cu.ft. per minute when delivering air at 100 lb. per square inch pressure. Air is supplied for sanders, bell ringer and control, in addition to the air brakes.

The present electrified system of the Tidewater Southern Railway is arranged for 1,200-volt operation, but will be changed over to 1,500 volts in the near future. The new locomotive was designed for operation at the higher voltage in view of the contemplated change in potential.

The locomotive carries all its weight of 120,000 lb. on the drivers. The cab is of the sloping end steeple type of construction, extending practically the whole length of the underframe, which consists of four heavy steel channels extending the entire length of the platform, and tied together by heavy steel end-frame castings. Each channel is riveted to the webs of the end frame castings and to the bolster plates on the bottom. The bolsters are built up of 1-in. steel plates, 10 in. in width riveted to all four longitudinal sills.

### Concrete Breaker in Cleveland

THE accompanying illustrations show a new machine developed by Charles H. Clark, engineer maintenance of way, Cleveland Railway, to break up the concrete pavement, or the concrete under and between the ties, in street railway tracks. The former method of using a ponderous weight is replaced by employing five hammers of less weight, and dropped on a point. All the hammers can be used at one time, or each one independently. In case of manholes or soft spots this becomes necessary.

The car is moved at the rate of about 8 ft. per minute by the use of a separate clutch. The operation consists

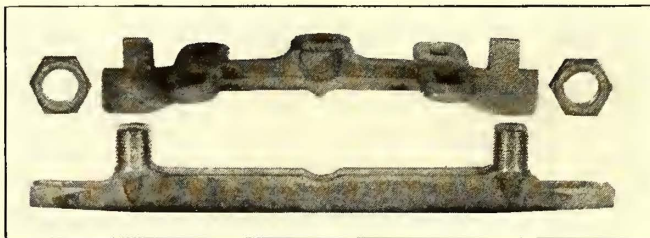
of spotting the car and allowing the weights to drop continuously till the concrete is shattered. The car is moved while the weights are going up.

The chains which carry the weight make a complete cycle in sixteen seconds which means two blows by each weight in this time, or a total of about thirty-eight blows per minute for the five hammers. The machine will break about 50 to 150 ft. of track per hour with two men at a labor cost of about 1 cent to 2 cents per foot of track.

### New Ear for Trolley Lines

THE General Electric Company has recently developed a new form of strain ear, known as the Form S, for use in trolley construction. It consists of two parts, the shoe and the body, the latter being made of malleable iron and the former of either iron or brass as desired. It is installed without the use of solder.

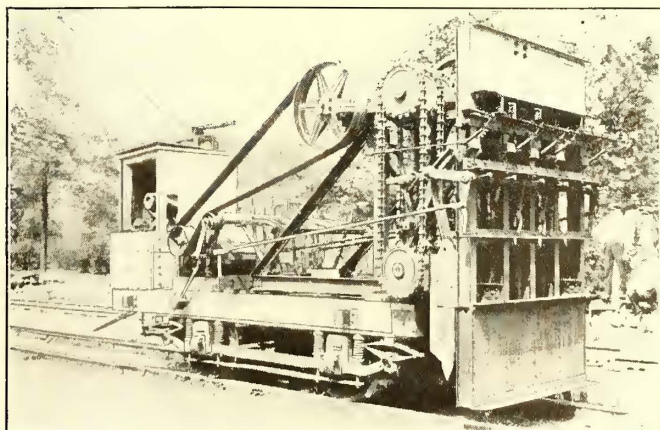
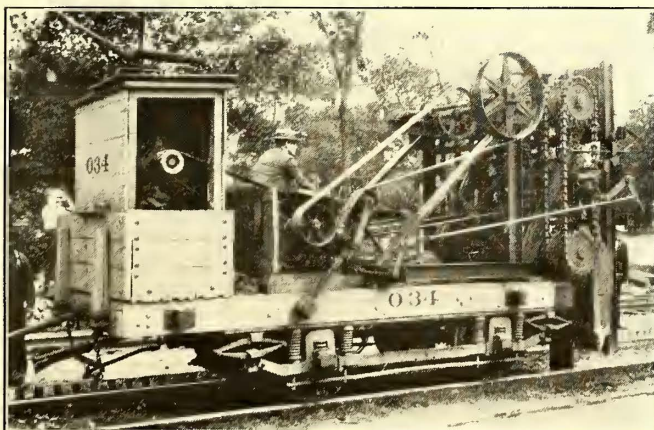
The new ear has several distinct advantages over former types, in that it has a renewable shoe, or wearing part, and the shoe can be removed without the use of block and tackle, or without disturbing either the trolley or anchor wires. In applying it the body is put on the wire and the shoe clamped to it by means of bolts which



STRAIN EAR DETAILS

fit on the threaded studs on the shoe. Once the body is in position it can stay there indefinitely, it being a simple matter to remove the shoe by loosening the clamping nuts.

In clamping the shoe into position the wire is slightly bent to follow the inequalities between the shoe and the body, which prevents the shoe from slipping on the wire. The anchor wires are attached to extension arms with 5-in. centers, preventing the trolley harp of a wild trolley from jamming or becoming wedged beneath the trolley and anchor wires. The shoe, which is the only wearing part, can be easily removed and replaced at a low cost without the necessity for special tools, and its cheapness helps considerably in lowering maintenance costs.



THIS CONCRETE BREAKER WILL DELIVER THIRTY-EIGHT BLOWS PER MINUTE

# American Association News

## Annual Convention Programs Ready

Programs of the American and Affiliated Associations Include Important Topics and Allow Time for Discussion

THE following tentative programs for the American and four affiliated associations have been prepared for the annual convention at Atlantic City, October 3 to 7. While possible changes may of course be made in these programs before Oct. 3, such changes should be slight and the programs here given present a fairly accurate outline of the meetings as planned.

### Program of American Association

(All sessions open)

Monday, Oct. 3, 1921

9:30 a. m. to 5 p. m.

Registration and Distribution of Badges at booth at Boardwalk entrance to pavilion in front of Haddon Hall, corner of Boardwalk and North Carolina Avenue.

Tuesday, Oct. 4, 1921

9:30 a. m. to 1 p. m.

Meeting held in Vernon Room of Haddon Hall

Convention called to order.

Annual address of the president.

Annual report of executive committee.

Annual report of the secretary and treasurer.

Appointment of convention committees:

(a) On resolutions.

(b) On recommendations in president's address.

Special report of executive committee relating to recommendations on current matters and changes in constitution and by-laws.

Reports of committees:

Aera Advisory—Charles L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., chairman.

Membership—F. R. Coates, president Toledo Railways & Light Company, Toledo, Ohio, chairman.

Company Section—Martin Schreiber, manager Southern Division and chief engineer Public Service Railway Company, Camden, N. J., chairman.

PAPER—Contrasted Advantages of Service-at-Cost Contract Franchise and State Regulation—EDWARD DANA, general manager Boston Elevated Railway, Boston Mass.

FORMAL DISCUSSION—ROBERT I. TODD, president Indianapolis Street Railway, Indianapolis, Ind.; S. B. WAY, vice-president and general manager Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

Reports of committees:

Publicity—Barron G. Collier, president Barron G. Collier, Inc., New York City, chairman.

Committee of One Hundred—Henry R. Hayes, Stone & Webster, Inc., New York City, secretary-treasurer.

Mail Pay—L. H. Palmer, assistant to president United Railways & Electric Company, Baltimore, Md., chairman.

National Relations—Charles L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., chairman.

Joint Committee of National Utilities Associations—P. H. Gadsden, vice president United Gas Improvement Company, Philadelphia, Pa., chairman.

Wednesday, Oct. 5, 1921

9:30 a. m. to 1 p. m.

Meeting held in Vernon Room of Haddon Hall

Report of committee on nominations. Election of officers.

Reports of committees:

Electrolysis—W. J. Harvie, general manager Auburn & Syracuse Electric Railroad Company, Auburn, N. Y., chairman.

Trackless Transportation—H. B. Flowers, vice-president and general manager United Railways & Electric Company, Baltimore, Md., chairman.

One-Man Car—R. P. Stevens, president Republic Railway & Light Company, New York City, chairman.

TOPICAL DISCUSSION OF ELECTRIC RAILWAY FINANCE—H. M. ADDINSELL, Harris Forbes & Company, New York City; F. E. FROTHINGHAM, Coffin & Burr, Boston, Mass, chairman. Other speakers to be announced.

PAPER—Comparative Position of the Industry Today and Four Years Ago—HENRY A. BLAIR, chairman, Chicago Surface Lines, Chicago, Ill.

FORMAL DISCUSSION — ROGER BABSON, president Babson Statistical Organization, Wellesley Hills, Mass.; EDWIN GRUHL, vice president North American Company, New York City.

Thursday, Oct. 6, 1921

9:30 a. m. to 1 p. m.

Meeting held in Vernon Room of Haddon Hall

Report of committee:

Valuation—Martin Schreiber, chief engineer and manager Southern Division, Public Service Railway Company, Camden, N. J., chairman.

PAPER—The Interest of Manufacturers in the Present Electric Railway Crisis.—Author to be announced later.

PAPER—Electric Railways and Their Community Uses—J. R. BIBBINS, manager Department of Transportation and Communication, United States Chamber of Commerce, Washington, D. C.

ADDRESS — HERBERT HOOVER has been invited to speak on the subject, Use of Electric Railways in Improving Industrial Efficiency.

Reports of Convention committees:

(a) On resolutions.

(b) On recommendations in president's address.

Unfinished business.

General business.

Installation of officers.

Adjournment.

### EVENING SESSION

A general meeting of the American and affiliated Associations has been planned for one evening of the convention.

The committee on subjects is arranging for a speaker of national prominence, while the committee on entertainment promises additional attractive features.

### Program of Engineering Association

Monday, Oct. 3, 1921

9:30 a. m. to 12:30 p. m.

Registration and distribution of badges at booth at Boardwalk entrance to pavilion in front of Haddon Hall, corner of Boardwalk and North Carolina Avenue.

2:30 p. m. to 5 p. m.

Meeting held in Solarium of Haddon Hall

Convention called to order.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary and treasurer.

Appointment of convention committees.

(a) On resolutions.

Reports of committees:

Apprenticeship Systems—F. R. Phillips, superintendent of equipment Pittsburgh Railways, Pittsburgh, Pa., chairman.

Heavy Electric Traction—Sidney Withington, electrical engineer New York, New Haven & Hartford Railroad, New Haven, Conn., chairman.

Tuesday, Oct. 4, 1921

2:30 p. m. to 5 p. m.

Meeting held in Solarium of Haddon Hall

Reports of committees:

Power Generation—A. B. Stitzer, chief engineer Republic Engineers, Inc., New York City, chairman.

Power Distribution—Charles R. Harte, construction engineer the Connecticut Company, New Haven, Conn., chairman.

NOTE—The joint report of the committee on stores accounting, representing the stores accounting committee of the Accountants' Association and the



committee on purchases and stores of the Engineering Association, will be held in Accountants' Room in the Hotel Chalfonte at 2:30 p.m.

**Wednesday, Oct. 5, 1921**

2:30 p.m. to 5 p.m.

Meeting held in Solarium of Haddon Hall

Reports of committees:

Way Matters—R. C. Cram, engineer surface roadway, Brooklyn Rapid Transit Company, Brooklyn, N. Y., chairman.

Buildings and Structures—D. E. Crouse, chief engineer Rochester & Syracuse Railroad, Syracuse, N. Y., chairman.

PAPER—Work of the Underwriters' Laboratories — GEORGE B. MULDAUR, general agent Underwriters' Laboratories, New York City.

**Thursday Oct. 6, 1921**

2:30 p.m. to 5 p.m.

Meeting held in Solarium of Haddon Hall

Reports of committees:

Equipment—Daniel Durie, general superintendent West Penn Railways, Connellsville, Pa., chairman.

Unification of Car Design—H. H. Adams, superintendent of shops and equipment Chicago Surface Lines, Chicago, Ill., chairman.

Standards—Martin Schreiber, manager Southern Division, Public Service Railway, Camden N. J. chairman.

Report of convention committees:

- (a) On resolutions.
- General business.
- Election of officers.
- Installation of officers.
- Adjournment.

**Program of Claims Association**

**Monday, Oct. 3, 1921**

9:30 a.m. to 12:30 p. m.

Registration and distribution of badges at booth at Boardwalk entrance to pavilion in front of Haddon Hall, Boardwalk and North Carolina Avenue.

2:30 p.m. to 5 p.m.

Meeting held in Hall Pavilion of Haddon Hall

Convention called to order.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) On resolutions.
- (b) On nominations.

Reports of committees:

On constitution and by-laws.

Interchange of Claims Statistics—H. D. Briggs, assistant general claim agent Public Service Railway, Newark, N. J., chairman.

Membership—C. G. Rice, manager Associated Bureaus, Pittsburgh Railways, Pittsburgh, Pa., chairman.

Resolutions—A. G. Jack, claim agent Wilmington & Philadelphia Traction Company, Chester, Pa., chairman.

Safety—

Subjects—W. G. Fitzpatrick, general claim attorney Detroit United Railway, Detroit Mich., chairman.

PAPER—Constructive Argument as Opposed to Constructive Contentions in Accident Investigations and Adjustments—LOUIS H. BUTTERWORTH, attorney Boston Elevated Railway, Boston. Discussion.

PAPER—Essential Points to Cover in Accident Investigation—R. C. GREEN, attorney Cleveland Railway, Cleveland, Ohio.

Discussion.

**Tuesday, Oct. 4, 1921**

2:30 p.m. to 5 p.m.

Joint Meeting with Transportation & Traffic Association.

Meeting held in Vernon Room of Haddon Hall

Reports of committees:

Traffic Regulation—H. B. Flowers, vice-president and general manager United Railways & Electric Company, Baltimore, Md., chairman.

Discussion.

Joint Committee on Safety Work—E. C. Spring, general superintendent Lehigh Valley Transit Company, Allentown, Pa., chairman; R. E. McDougall, general manager New York & Harlem Railroad, New York City, co-chairman.

Discussion.

**Wednesday, Oct. 5, 1921**

2:30 p.m. to 5 p.m.

Meeting held in Hall Pavilion of Haddon Hall

PAPER—What Should Be the Method

of Claim Departments in Handling Accidents and Claims? — WALTER E. ROBINSON, claim agent Cincinnati Traction Company, Cincinnati, Ohio.

Discussion.

Free-for-all discussions:

(a) Value of Publicity in Claims Work.

(b) Best Method of Handling Hospital Cases.

(c) Auto Hazard.

(d) Using the Mails to Obtain Witnesses' Statements.

(e) Claims by Company for Damage to Its Equipment and How Such Claims are Handled.

Report of convention committees:

- (a) On Resolutions
- (b) On Nominations
- Election of officers.
- Installation of officers.
- Adjournment.

**Program of Transportation and Traffic Association**

**Monday, Oct. 3, 1921**

9:30 a.m. to 12:30 p.m.

Registration and distribution of badges at booth of Boardwalk entrance to pavilion in front of Haddon Hall, Boardwalk and North Carolina Avenue.

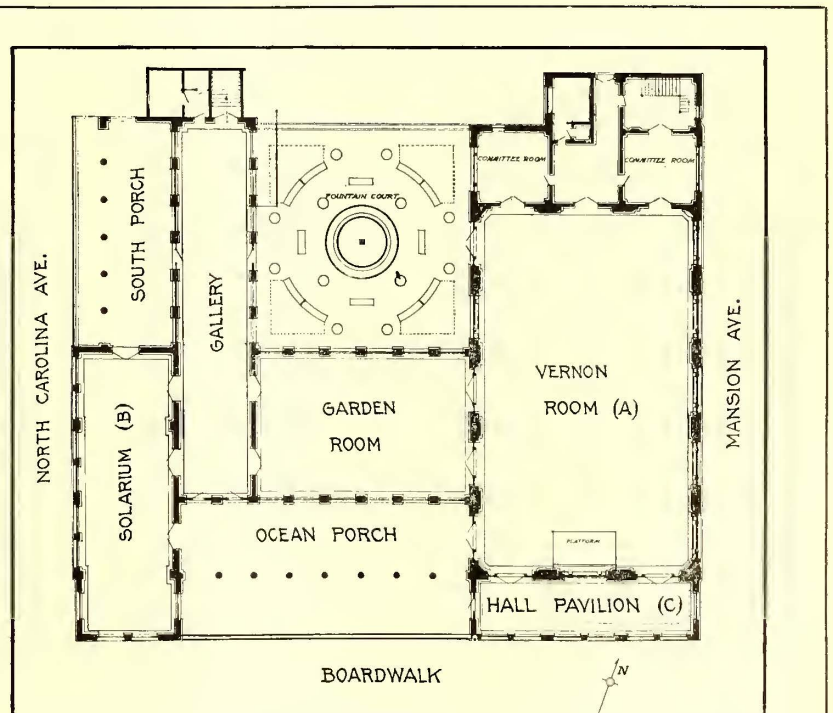
2:30 p.m. to 5 p.m.

Meeting held in Vernon Room of Haddon Hall

Convention called to order.

Annual address of the president.

Annual report of the executive committee.



ARRANGEMENT OF MEETING HALLS FOR ANNUAL CONVENTION AT ATLANTIC CITY

A—Meeting hall of the American and the Transportation and Traffic Associations.

B—Meeting hall of the Engineering Association.

C—Meeting hall of the Claims Association.

NOTE—The Accountants' Association will hold its meetings at the Chalfonte Hotel, except as noted in the program.

Annual report of the secretary and treasurer.

Appointment of convention committees.

- (a) On resolutions.
- (b) On nominations.

Report of committee:

Merchandising of Transportation—J. H. Alexander, vice-president Cleveland Railway, Cleveland, Ohio, chairman.

Discussion.

**Tuesday, Oct. 4, 1921**

2:30 p.m. to 5 p.m.

Joint meeting with Claims Association.

Meeting held in Vernon Room of Haddon Hall

Reports of committees:

Traffic Regulations—H. B. Flowers, vice-president and general manager United Railways & Electric Company, Baltimore, Md., chairman.

Discussion.

Joint Committee on Safety Work—E. C. Spring, general superintendent Lehigh Valley Transit Company, Allentown, Pa., chairman; R. E. McDougall, general manager New York & Harlem Railroad, New York City, co-chairman.

Discussion.

**Wednesday, Oct. 5, 1921**

2:30 p.m. to 5 p.m.

Joint meeting with Accountants' Association.

Meeting held in Vernon Room of Haddon Hall

Reports of committees:

Joint Committee on Economics of Schedules—Edward Dana, general manager Boston Elevated Railway, Boston, Mass., chairman; A. G. Neal, comptroller Washington Railway & Electric Company, Washington, D. C., co-chairman.

Discussion.

Joint Committee on Express and Freight Traffic Promotion and Costs—F. W. Coen, vice-president Lake Shore Electric Railway, Sandusky, Ohio, chairman; L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., co-chairman.

Discussion.

**Thursday, Oct. 6, 1921**

2:30 p.m. to 5 p.m.

Meeting held in Vernon Room of Haddon Hall

Report of committee:

Personnel and Training of Transportation Employees—James P. Barnes, president Louisville Railway, Louisville, Ky., chairman.

Discussion.

Suggestions.

General discussion.

General business.

Report of convention committees:

- (a) On resolutions.
- (b) On nominations.
- Election of officers.
- Installation of officers.
- Adjournment.

## Program of Accountants' Association

**Monday, Oct. 3, 1921**

9:30 a.m. to 12:30 p.m.

Registration and distribution of badges at booth at Boardwalk entrance to pavilion in front of Haddon Hall, corner of Boardwalk and North Carolina Avenue.

2:30 p.m. to 5 p.m.

Meeting held in Accountants' Room in Hotel Chalfonte

Convention called to order.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) On resolutions.
- (b) On nominations.

Reports of committees:

Standard Classification of Accounts—H. L. Wilson, treasurer Boston Elevated Railway, Boston, Mass., chairman.

Representing Accountants' Association at the annual convention of the National Association of Railway and Utilities Commissioners—C. S. Mitchell, comptroller Pittsburgh Railways, Pittsburgh, Pa., chairman.

PAPER—Electric Railway Cost Accounting—JOHN HALL BOWMAN, C. P. A., Price, Waterhouse & Company, New York City.

Discussion.

**Tuesday, Oct. 4, 1921**

2:30 p.m. to 5 p.m.

Meeting held in Accountants' Room in Hotel Chalfonte

Joint Report—Stores Accounting.

Stores Accounting Committee of the Accountants' Association—R. A. Weston, special accountant the Connecticut Company, New Haven, Conn., chairman. Committee on Purchases and Stores of the Engineering Association—H. W. Staub, purchasing agent United Railways & Electric Company, Baltimore, Md., chairman.

Discussion.

PAPER—Departmental Accounting, including Budget Control of Construction and Operating Expenditures—H. C. HOPSON, C. P. A., 61 Broadway, New York City.

Discussion.

PAPER—Construction Accounting—W. E. JONES, assistant comptroller United Electric Railways, Providence, R. I.

Discussion.

**Wednesday, Oct. 5, 1921.**

2:30 p.m. to 5 p.m.

Joint meeting with Transportation and Traffic Association.

Meeting held in Vernon Room of Haddon Hall

Reports of committees:

Joint Committee on Economics of Schedules—Edward Dana, general manager Boston Elevated Railway, Boston, Mass., chairman; A. G. Neal, comptroller Washington Railway & Electric Company, Washington, D. C., co-chairman.

Discussion.

Joint Committee on Express and Freight Traffic Promotion and Costs—F. W. Coen, vice-president Lake Shore Electric Railway, Sandusky, Ohio, chairman; L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., co-chairman.

Discussion.

Accounting members will return to Accountants' Room in Hotel Chalfonte.

Reports of convention committees:

- (a) On resolutions.
- (b) On nominations.
- Election of officers.
- Installation of officers.
- Adjournment.

## Entertainment Committee Holds Meeting

THE Entertainment Committee in charge of activities for the Atlantic City Convention, Oct. 3-6, of which E. C. Faber, New York, is chairman, held its first meeting at association headquarters on Aug. 15.

The committee considered several plans for entertainment. A sub-committee was appointed which has, since the meeting, visited Atlantic City and prepared several suggestions for the entire committee to consider at its meeting Friday, Aug. 26. The entertainment features will be comprehensive, and all in attendance will be assured of not having any excess time on their hands.

## Nominating Committee Appointed

PRESIDENT GADSDEN announced the following as the nominating committee of the American Association for the 1921 election. The committee was requested to report nominations as soon as practicable:

J. H. Pardee, president J. G. White Management Corporation, New York, chairman.

P. S. Arkwright, president Georgia Railway & Power Company, Atlanta, Ga.

F. G. Buffe, general manager Kansas City (Mo.) Railways.

W. A. Draper, vice-president Cincinnati (Ohio) Traction Company.

E. C. Faber, Barron G. Collier, Inc., New York.

Thomas Finigan, American Brake Shoe & Foundry Company, Chicago.

The appointment of this committee at this time is in line with the announced policy of the executive committee and is an invitation to the members at large to offer suggestions to this committee regarding the officers to be elected this fall.

# News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION  
PERSONAL MENTION

## Daniel W. Smith a Seer

No Future for Surface Electric Railways, Says Candidate for Mayor of Detroit

The possibility of the railway question in Detroit, Mich., again being made a political issue in the coming election for Mayor, became evident with the announcement by Daniel W. Smith, candidate for Mayor, that a communication has been prepared and will be sent to the Council requesting action by that body directing that plans be prepared at once by the Mayor and the Street Railway Commission, and estimates be obtained on the cost of a comprehensive rapid transit system to be owned and operated by the city.

### TRANSPORTATION REPORT IN PREPARATION

At about the same time the Street Railway Commission announced that a report would be made public which covers the complete transportation system in Detroit, including surface lines, subway and elevated road possibilities. This report has been in preparation two months.

The reason given by Mr. Smith for sending his communication to the Council at this time was that no steps have been taken by Mayor Couzens leading to rapid transit. It was further claimed that the present plan for municipal railways threatens to bring the city to the point where the city's bonding limit would be reached, without provision for a rapid transit system and no money available for carrying out such a system.

In referring to Mayor Couzen's proposed plan to operate jitneys and buses on Fort Street and Woodward Avenue, until tracks can be laid, in event the Detroit United Railway removes its tracks from these streets, as ordered by the city, Mr. Smith states that the situation which will result from such arrangement may reveal the lack of vision on the part of the present administration in carrying out the program for a municipal transportation system.

Mr. Smith questions the wisdom of paying \$288,000 for the Fort Street and Woodward Avenue tracks of the Detroit United Railway, or taking over any of the property of the Detroit United Railway on streets that can be better served by rapid transit.

### SUBWAY SUGGESTED

A subway is suggested to be run in a northerly direction from the heart of the city to the Ford plant, or some place farther north. This, it is stated, should connect with the rapid transit elevated lines of the improved type running as crosstown or east and west

lines. These lines, Mr. Smith states, should be augmented with motor buses, trackless trolleys or with some other surface lines all fitted into a system that will be adequate for Detroit's needs. Mr. Smith states that all large American cities are on the eve of a radical change in transportation methods.

Mr. Smith cites that jitneys are a product of hard times, but that the significant point remains that the working men and women in Detroit even in a period of depression, have been willing to pay a fare twice that collected on the electric cars, in order that they may shorten the running time between their homes and places of employment.

According to Mr. Smith, "the handwriting on the wall" is daily becoming more evident—that there is no future for surface electric railways, the people demanding more speedy means of transportation than can be afforded by surface lines.

## Fresno Franchise Conferences to Continue

The conference held early in the present month between members of the City Commission of Fresno, Cal., and officers of the Fresno Traction Company over the new indeterminate franchise submitted to the commission by the railway adjourned without any settlement of the points at difference between the commission and the officials of the railway. In the opinion of City Attorney Johnston, the franchise in the form in which it was submitted by the railway would have to go to a vote of the people of the city before it could be put into effect by the city government. Members of the City Commission agreed that it was useless to go into a discussion of the details of the city charter until this question had been settled.

### OPINION DIVIDED OVER RECENT STATUTE

The attorneys for the railway are understood to have taken the position that the franchise as proposed by the company could be passed by the City Commission. It was suggested by Commissioner Anton that pending another meeting, the City Attorney of Fresno should communicate with other cities where the indeterminate franchise is in effect and secure the opinion of the City Attorneys on the various points that are in doubt in the present situation in Fresno.

The differences of opinion that exist as to the probable authority of the city to proceed with the negotiations have arisen over the fact that in 1919 the State Legislature passed a general statute for granting resettlement franchises by cities operating under a freeholder charter.

## Safety Council Progressing

Community Wide Plan Well Under Way to Reduce Accidents—Railways Co-operating

The Chicago Safety Council, started April 16, 1920, has since been actively at work in a community-wide plan of education to reduce the loss of human life and property through accidents and carelessness. The council is organized as a department of the Chicago Association of Commerce and functions by means of four divisions and twenty committees and operates through the homes, schools, churches, industries and civic organizations, thus reaching and instructing practically the entire community in its important activities.

A school for safety supervisors was conducted by the Safety Council from Sept. 14, 1921, to March, 1921, with an average attendance at fifteen meetings of 475 men, the school graduating 283 men qualified to supervise safety work in industry. Beginning Dec. 2, 1920, a foreman's safety instruction course was conducted from which 310 men were graduated on June 7. Of these graduates, fifty were employees of the Chicago Elevated Railways. The average attendance at ten meetings was 525 foremen, representing approximately 50,000 workmen. A police and traffic committee was organized and has been energetically at work to prevent traffic accidents. On June 28 a motor drivers' safety instruction course was concluded, in which an average of 610 chauffeurs and truck drivers received practical instruction in safety, rules of the road, automobile mechanics, etc., and diplomas awarded to 469 graduates. A juvenile safety committee was completed which is now making an intensive study for the purpose of minimizing accidents to juveniles, representatives of the Boy Scouts, Camp Fire Girls, boys' clubs, etc., serve on this committee. An electric transportation committee was also organized, which is devoting its attention to the prevention of accidents involving the operation of street cars, elevated trains, taxicabs, motor buses, etc. Beginning Oct. 9 a "No Fire, No Accident Week" will be promoted in conjunction with the semi-centennial anniversary of the Chicago fire. Extensive plans are being laid for a safety campaign throughout the entire city.

The transportation companies in Chicago are, of course, taking an active part in this work, and will derive considerable benefit from the wide activity along safety lines that is being fostered by many influential men and through numerous organizations and committee.

## Making American Citizens

North Shore Line Is Conducting Evening Classes for Its Trackmen, 78 per Cent of Them Foreigners

The Chicago, North Shore & Milwaukee Railroad is taking an interest in making American citizens of its trackmen, most of whom are foreigners. The company believes that in so doing not only would it be a material aid in the general need for Americanization work throughout the country, but that it would also result in making better employees of the men. The story is well told by Luke Grant in the July issue of *The North Shore Bulletin*, published by the company for the entertainment and edification of its patrons.

When it was decided a few months ago to begin a campaign of Americanization work among the track gangs

preferred to have American citizens on its payrolls, who could speak and write our language, and that may have influenced some. There could be no mistaking, however, the earnestness of most of the men to attend school and their eagerness to learn. One of them expressed what was in the mind of many when he said through an interpreter, he would give \$1,000 if he could learn to read and write English.

That the men are taking a great interest in the work is shown by a glance at the weekly report of C. G. Goodsell, director of Americanization work, showing the attendance. A full attendance is, of course, hardly to be expected, because at times there is emergency work to be done which necessitates the men absenting themselves from the classes. In spite of that a number of sections showed an 80 per

are being paid for their attendance, but if they do not understand the English language they cannot derive much benefit from the talks.

Behind the whole plan is the big idea of making American citizens out of a class of laborers who are under a heavy handicap. Mr. Goodsell, the director, is assisted by J. S. Hyatt, engineer of maintenance of way, and by his assistant, F. J. Cramer.

### Reduced Pay in Allentown

A reduction of a little less than 10 per cent in the wages of motormen and conductors of the Lehigh Valley Transit Company, Allentown, Pa., became effective on Aug. 1. The following is the same scale that was in effect on Aug. 1, 1919:

	Cents Per Hour
First year .....	44
Second .....	48
Third .....	50

Twelve cents an hour extra for overtime. A guarantee of \$2.25 a day.

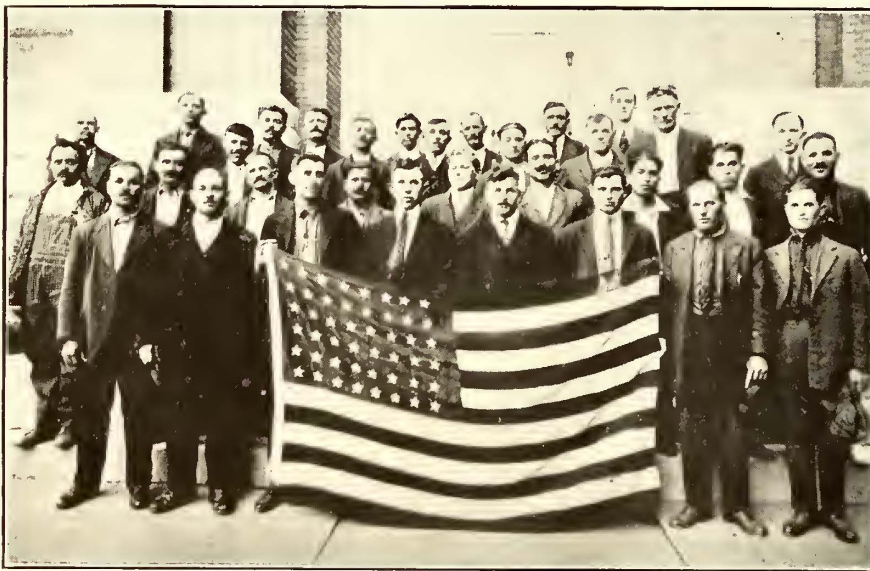
### Wages Cut 4 Cents an Hour

Approximately \$60,000 a year will be saved to the Memphis (Tenn.) Street Railway by the wage award which has been made by the arbitration committee. Wages of all employees are cut 4 cents an hour by the award. This amounts to \$2.08 a week on the average for each man. The new wage scale under the award is 43 cents an hour for first-year men, 48 cents for second-year men, and 53 cents for men with three years or more service.

W. J. Bacon, representing the railway employees, opposed any cut in wages. Thomas H. Jackson, representing the company, sought a reduction of 12 cents as asked by the company. Judge Ben L. Capell was chairman of the board.

### Franchise Contracts Discussed

The Illinois Committee on Public Utility Information has issued a pamphlet, "Rate Contracts Between Municipalities and Utilities," prepared by Walter A. Shaw, an engineer and at one time a member of the State Utilities Commission. Mr. Shaw discusses the question of contracts and commission rulings from the viewpoint of the public representative. In view of the recent agitation over the charge that the Illinois State Public Utilities Commission broke contracts existing between utilities and municipalities in readjusting rates to meet existing conditions the booklet is very timely. In another pamphlet, the fifth of a series issued by the Illinois Committee, the legal status of rate contracts between utilities and municipalities is discussed. Material in this bulletin consists largely of citations from court decisions, findings of commissions and views of men who have made a special study of regulation and franchises, together with a statement set forth in question and answer form relative to the subject of so-called rate contracts.



NORTH SHORE LINE TRACKMEN AT WAUKEGAN COURT HOUSE TO TAKE OUT FIRST PAPERS

of the North Shore Line, a general survey was made to obtain accurate information. The survey disclosed that at the time there were 129 men, including foremen, in these gangs and that 101 of them, or 78 per cent, were not American citizens. Twelve men were eligible to full citizenship, but 85 men, or 66 per cent, had not declared their intentions to become citizens, although they had been in the country upward of five years. In fact the average length of time in the United States of all the men was eleven years. The men ranged in age from eighteen to sixty years, the average being thirty-six years. Eighty-two men, or 64 per cent, could not write the English language and 58 per cent could not read it. Twenty-nine of the men, or 22 per cent, could not speak English and 27 per cent could neither read nor write their native tongue.

When the subject of attending evening school and learning to read and write English was broached to the men, the response was instantaneous and almost unanimous. True, the men were given to understand that the company

cent attendance and Section No. 4 was 100 per cent. That section appears to have 100 per cent attendance week after week.

On the whole road there are fourteen regular section gangs and one extra gang and the schools are located to make it as convenient as possible for the men to attend. The classes are so arranged that each gang has two evenings a week. There is also a school for foremen. The classes are given "home work."

The teaching of English among the track laborers is made to fit in nicely with the safety work conducted by the North Shore Line. Each month a special car is run along the line from Evanston to Milwaukee and it picks up the track gangs wherever they happen to be at work. The car is then run to the nearest side track and a safety meeting is held at which some speaker gives the men an instructive talk on safe practices. The gang is taken back at the end of the meeting and the car proceeds to the next point. That method insures a full attendance of the men at safety meetings, because they

## Franchise Vote in Houston on Sept. 27

The City Council of Houston, Tex., has set Sept. 27 as the date on which an election will be held at which qualified voters will pass on the new street railway franchise, which has just been completed after extended negotiations between the city and officials of the traction company.

The new franchise provides for an extension of 15 years from 1935 of the present franchise with certain changes. Valuation of the property of the Houston Electric Company is placed at \$6,000,000 plus any capital expenditures since March, 1920. The new franchise also provides for earnings of 8 per cent on the agreed valuation and allows 4½ per cent depreciation.

The city has the right to demand a reduction in fare, which is now 7 cents, when earnings of the traction company reach the 8 per cent authorized. The city also has the right to call for a re-valuation of the property as soon after the acceptance of the franchise as the city may deem expedient. In case the voters approve the franchise, the traction company is given thirty days in which to file notice of its acceptance.

## Helpful Editorial on Accidents

Efforts by the management of United Railways, St. Louis, Mo., to convince the public that it is the car riders who suffer when juries return excessive judgments against the transportation company is showing results through the press. In an editorial a few days ago the *Post-Dispatch* said:

Street car carelessness cost car riders \$715,268 last year. That is what the United Railways paid out in verdicts for damages, court fees and compromise settlements as shown by the report of Col. A. T. Perkins, manager for the receiver. In theory the company paid it. But this is only a pleasant fiction. The public paid it. A certain percentage of the fares went for that purpose. That is one reason why it costs 7 cents to ride on St. Louis street cars.

The editorial directed attention to the fact that suing the railway is one of the most popular indoor pastimes. Last year 708 persons tried their hand at it. The plaintiffs won \$515,268 and the plaintiff's lawyers got about \$225,000. The cost last year was \$318,000 more than the year before, and the way things are going now it looks as if the cost this year will be more than \$1,000,000. Says the *Post-Dispatch* further:

The one pleasant fact is that three-fourths of the cases are compromised. That shows that the spirit of compromise is present, and that is a good thing. Where there are so many passengers and so many employees there is bound to be some carelessness and some accidents which call for adjustment. The more they are settled out of court the less the cost to the traveling public.

## Grand Rapids Case Considered Again

The City Commission of Grand Rapids, Mich., met as a committee of the whole recently to discuss anew the proposal to grant a franchise to the Grand Rapids Railway with provision for a basis of return commensurate with the needs of the company.

It was stated by Attorney Knappen and concurred in by L. J. DeLamarter, manager of the railway, that the best of three proposals, both for the welfare of the public and the company, would be a valuation of \$7,000,000 with an 8½ per cent return. The commissioners all practically agreed that the \$600,000 revenue is essential to the welfare of the city as well as the company, in order that the service might be improved.

The company representatives stated a 10-cent fare for transient and casual riders, with tickets sold to regular patrons at four for 25 cents, would take care of the revenue at the present time, and that later this fare might be lowered.

## A Jitney Editorial

The accompanying editorial appeared in the Aug. 16 issue of the *Greensburg (Pa.) Record*. It is given here as an indication that lessons from the Des

### Jitney or Street Car?

Out in Des Moines, Iowa, on the first day of this month all street car service was discontinued because of the inability of the street car company to pay running expenses, due to jitney competition.

Can the reader conceive what the situation would be in Westmoreland county if our own street car lines were put out of commission? The writer has had the experience of being in one city where there were no street cars, but that was at Newport, R. I., in the aristocratic section of the city where practically each member of the family had a "super-six" and the maids and butlers rode on bicycles. "We" traveled on "Shank's Mare" and would have given a great deal to have heard the welcome gong of a street car and gladly turned our shekels over to a blue coated conductor, with the confidence that we would reach our destination regardless of tire and engine troubles.

When it comes to a "toss up" between the street car and the jitney, give us the good old street car that is there when you want it, and you know that the conductor is not going to stick a revolver in your face and turn your pockets inside out, or beat it out a side street with your wife, or daughter, for a ransom—the auto bandit never kidnaps a mother-in-law.

If a street car company can't run on a five-cent fare then give 'em eight cents. The street cars are compelled to run rain or shine, hail or snow, while the jitney driver may be snoozing away until the weather becomes favorable. The jitney has its place, but it will have to get on a trolley and make a noise like a street car before it can fill the bill of the fast growing population of our towns and cities.

Des Moines jitney experience are being learned by the public of other cities as well. The editorial is, of course, only one of a great number of such comments, but it does bring home strikingly the lesson of the trolleyless city.

## New Power Contract Submitted at Toledo

Street Railway Commissioner Wilfred E. Cann has announced that the Toledo Railways & Light Company has submitted a new power contract which would save the Community Traction Company approximately \$160,000 a year over the rate now being paid. The new contract would date back to Feb. 1, the time when the service-at-cost franchise went into effect. The report says:

After numerous conferences with representatives of the Toledo Railways & Light Company, we have received what is emphatically stated to be a final proposition on the power rate; this new rate to be \$24 per annum per kwh. for installed capacity as a demand charge plus 9 milles per kwh. for consumption plus the operation of the coal clause.

For the six months ending July 31, the rate per kwh. on the basis would be 1.87734, and the total saving in the power bill over the same period would amount to \$77,327. For the operation of the coal clause the net cost per kwh. for the next six months should be slightly less than 1.87, and the total reduction of the power bill for the first year of operation should be approximately \$160,000. This offer is submitted on the basis of a one-year contract only and with the idea of a revised rate beginning Feb. 1 of next year. Upon the basis of \$160,000 saving in power cost, reducing the monthly credits to the maintenance and repair fund, increased revenue from interurban travel, and the strictest economy in operation, I am convinced that by Oct. 1 we can have actual cash credits in each of the funds equivalent to the accrued set up, and by Feb. 1, which will complete the first year of operation, the deficit to the stabilizing fund should be reduced at least \$40,000 leaving it with a balance of \$220,000.

## Injunction for Jitneys at Rockford

The Fay Motor Bus Company, Rockford, Ill., which has been operating several lines of buses in Rockford for more than two years, under a certificate of convenience and necessity issued by the Illinois Public Utilities Commission, recently decided to go into full competition with the city lines of the Rockford & Interurban Railway, and attempt to supply transportation throughout the city at a 5-cent fare. The bus company has heretofore charged 10 cents and has been but partially in competition with the railway, which is charging a rate of fare of 8 cents. The decision to operate throughout the city was not preceded by a certificate from the commission, and consequently the railway was able to secure an injunction. This promptly put a stop to such operation.

The hearing on this temporary injunction will probably be had on Aug. 29 or shortly thereafter. Meantime Thomas J. Fay, president of the bus company, is endeavoring to secure the passage of a city ordinance permitting operation of buses throughout the city on a 5-cent fare. If such an ordinance were passed, the bus company assumes that this would be a strong inducement to the state commission to grant the certificate required. Mr. Fay has been active recently in an endeavor to secure a franchise to provide the complete transportation service in Des Moines, Ia.; in Decatur, Ill., and other places. It is understood that his 10-cent bus lines in Rockford have been popular and profitable.

## Details of Detroit's Trolley Bus Bids Announced

The following bids have been received by the Street Railway Commission, Detroit, for furnishing 50 trolley buses, specifications for which are given on page 320 of this issue:

At present the railway is charging 15 cents a car mile for the use of tracks and power and 75 cents a round trip for the use of the Terminal Station. Under the new arrangement, it was explained, the interurban companies will pay between 21 cents and 25 cents a car mile for tracks and power.



Bidder	Bid per Bus
1. J. G. Brill Co., Philadelphia, Pa.	F.o.b. Detroit
First 10 .....	\$8,744.00
Remaining 40 .....	8,544.00
Goodyear pneumatic tires additional.....	300.00
2. Standard Motor Truck Co., Detroit, Mich.	
Total of 50 (war tax included) .....	8,950.00
Pneumatic tires, additional .....	735.00
Delivery first 10 120 days from order.	
3. National Safety Car Equipment Co., St. Louis, Mo.	
Total of 50 .....	7,325.28
Delivery first 10 from 7 to 10 weeks.	
4. St. Louis Car Co., St. Louis, Mo.	
Total of 50 .....	7,800.00
Delivery to begin 100 days after order.	
5. Packard Motor Car Co., Detroit, Mich.	
Total of 50 with St. Louis Car Co. body (war tax included) .....	8,065.09
Total of 50 with Cincinnati Car Co. body (war tax included) .....	8,127.75
Total of 50 with Osgood-Bradley Co. body (war tax included) .....	8,230.55
Total of 50 with Kuhlman Car Co. body (war tax included) .....	9,486.36
Delivery, one complete 60 days, 20 in 60 to 90 days, and 50 in 90 to 120 days.	
6. Mack International Motor Truck Corp., Detroit, Mich.	
Total of 50 (war tax included) .....	9,988.00
Total of 10 (war tax included) .....	10,488.00
Pneumatic tires, additional .....	350.00
Delivery of first 10 in 80 days, then 2 per week. Complete in 108 working days.	
7. Trackless Transportation Co., New York, N. Y.	
Total of 50 (exclusive of war tax) .....	8,195.00
Pneumatic tires, additional .....	200.00
Delivery from 90 to 120 days.	

## Car Men Express Views

Employees of the Memphis (Tenn.) Street Railway have been conducting little talks in the *News-Scimitar* on the troubles of the street railway man, his ideas on service, etc. "Uncle Billie Miller," in the opening article of the series, discussed "When to Get Transfers." Another article is written by B. E. Hudson, a veteran motorman, who speaks on behalf of all his associates of the Memphis Street Railway. He makes an especial appeal to automobile drivers to allow the car man to have the right-of-way on his own car tracks. He says in part:

We motormen want to make our schedules—we want to carry our passengers to their destinations quickly, and not keep people waiting at points ahead.  
Help us to make good records with the company—and good names with the public.

## New Plans Submitted for Handling Freight

Representatives of the Indianapolis Street Railway and of Indiana interurban companies appeared before the Public Service Commission recently to show the necessity for a terminal charge at the freight terminal on Kentucky Avenue. The companies are asking for a charge of 3 cents on each 100 pounds of freight handled.

Under a new contract, which has been entered into, additional buildings will be constructed in ground occupied by the Kentucky Avenue terminal, and practically all freight business will be moved from the Terminal Station. The railway, under this arrangement, will have nothing further to do with freight facilities other than furnishing tracks and power. At the present time the railway owns all the facilities at the Terminal Station and rents them to the interurban companies.

The commission, when passing on street-car rates in Indianapolis, called attention of the car company and the traction lines to the present inadequate facilities for handling freight at the present terminal station. The companies were ordered to submit plans for the improvement of the situation, and the Kentucky Avenue terminal station idea was agreed on by the companies. Arthur L. Brady, president of the Union Traction Company, presented the plans for the improvement.

## Wages of Municipal Railway Employees May Be Cut

In preparing the city budget for 1922, members of the City Council of Seattle, Wash., adopted a policy of making a cut of 50 per cent in the blanket increase in pay granted to all city employees in 1919. This action would mean a reduction in the wages of the employees on the Seattle Municipal Railway of 25 cents a day in all cases. The present wage scale is \$4.75 for the first three months' service, \$5 for the second three months and \$5.25 thereafter. This time last year the men asked for an increase of 25 per cent in their pay, but this was denied by the Council. A reduction of wages for trainmen has not, however, been definitely decided upon by the Council.

**Wage Cut Pending Settlement.**—Employees of the Tacoma (Wash.) Municipal Street Railway have signed an agreement which reduces their wages from 3 to 5 cents an hour. The new scale is similar to that in effect on Aug. 1, 1919, providing pay of 50, 55 and 60 cents an hour instead of 55, 59 and 63 cents, which the men were receiving. This cut will be in effect on Aug. 31, pending negotiations.

**May Abandon Line.**—Unless traffic increases on the line of the Asheville & East Tennessee Railroad, which operates between Asheville and Seaver ville, a distance of 9 miles, the line will be junked. The preference for jitneys is assigned as one reason for the unsuccessful operation of the electric property.

**Wage Cut on Interurban.**—The conferences between the officers of the Ohio Electric Railway, Springfield, Ohio, and representatives of the trainmen have resulted in an agreement on the wage question. The new scale provides a maximum wage of 49 cents an hour for interurban men, which is a cut of 11 cents an hour from the old scale. The cut for the first year is 8 cents an hour for the first three months and 9 cents an hour for the next nine months. City men will receive a maximum of 46 cents an hour, or 11 cents less than they receive at the present time. The cut for the first year amounts to 8 cents an hour for city men.

**Government Will Appoint Wage Umpire.**—Developments are tardy in the wage situation between the Montreal Tramways and its employees. The men are working under the 12½-per cent reduction put in force on Aug. 16, pending the sitting of the board of arbitration granted on the men's application to the Federal Department of Labor. A. Brossard, chosen as the union representative on the board, and A. P. Frigon, appointed by the Federal Minister of Labor to represent the company on default of the latter to name its own representative, have failed to agree on a third man to act as chairman, and he also will be appointed by the Minister.

## Coming Association Meetings

### Iowa Electric Railway Association

THE Iowa Electric Railway Association will hold its mid-year meeting for operating men at Waterloo, Iowa, Sept. 15 and 16.

### Colorado Electric Light, Power & Railway Association

THE Colorado Electric Light, Power & Railway Association will hold its eighteenth annual convention in conjunction with the second annual convention of the Rocky Mountain Division of the National Electric Light Association at the Hotel Colorado, Glenwood Springs, Col., Sept. 19, 20 and 21. On the same date a meeting of the accounting section of the N. E. L. A. will be held at the Hotel Colorado, and it is expected that members from all over the United States will be present.

# Financial and Corporate

## \$44,788,237 Value Found

**Expert for City of New Orleans Revises His Figures Upward More Than \$11,000,000**

F. W. Ballard, Cleveland, Ohio, expert employed by the commission government of New Orleans, La., to advise it on utility problems, has reported his findings. Mr. Ballard values the properties of the New Orleans Railway & Light Company at \$44,788,237, on which amount he says a return of 8 per cent should be allowed. He recommends no change in the rates for energy, but proposes a 7-cent fare and a reduction in the rate for gas to \$1.30 per 1,000 cu.ft. He approves the statement of the company that \$23,242,000 is needed for improvements during the next five years. He favors the election of residents of New Orleans to the directorate of the company. He recommends an indeterminate franchise for the company. His statement of the value of the various departments of the company is as follows:

Railway department.....	\$21,379,414
Electric department.....	10,030,071
Gas department.....	7,523,365
<b>Total .....</b>	<b>\$38,932,850</b>
Loans to city.....	185,000
Unamortized obsolete property..	5,670,387

Total .....\$44,788,237

In the total for the railway department there is an item of \$3,342,913 for intangibles, franchises, administration and organization. Mr. Ballard explains that the table does not include anything for going concern value nor any allowance for promotion expenses. He does not believe it would be possible at this time to determine these costs, and points out that in the valuation of 1918 the city took the position of not allowing for these items. He expresses doubt, however, "if we would be sustained in this contention by the courts; the probabilities are that some allowance would be made for these items."

The report of Mr. Ballard has, for the time being, been relegated to the background, a new angle to the controversy having developed as the result of the activities of Commissioner Paul Maloney, of the Department of Public Utilities. Commissioners Roy, Black and Murphy, however, are not unfavorably disposed towards the Ballard report. Even though Mr. Ballard's finding is not absolutely in harmony with their views, they realize that the light and power problem is a matter which should be settled at once, if industrial disaster is to be averted. Mayor McShane sides with Commissioner Maloney in opposing the report.

Commissioner Maloney is for scrapping the Ballard report and breaking off relations of any kind with utility experts. With this idea in view, he propounded a number of interrogations to the city attorney, the gist of which

was whether or not the city was not the rate-making power in the controversy. City Attorney Kittredge, in making reply, holds to the opinion that the Commission Council, and the Commission Council alone, is vested with this authority.

This makes for a brand new issue in the matter and has contributed not a little in adding to the complexities of the problem and in increasing the lack of harmony in taking quick action upon the Ballard report. Armed with this opinion, Commissioner Maloney declares the Commission Council has the same authority to fix the rates of fare as the Louisiana Service Commission has to fix the freight and passenger rates over rail lines in the State. He is of the opinion that the New Orleans Railway & Light Company should come to the Commission Council and ask for the rate it wants and that a hearing should then be had to determine the merits of the application.

Thomas F. Cunningham, president of the Board of Trade, in criticising the tardiness of the city in reaching a settlement of the matter, calls the attention of the Commissioners to the fact that, in their failure to reach a solution of the railway problem, they overlook the greater and more important matter to be solved, namely, the rehabilitation of the electric light and power plant.

Mr. Ballard, who reported to the city last year a valuation of \$34,586,000 for the property, was retained again by the city, as he expresses it, "to take under consideration the valuations which have been made and to bring these values up to date, to the end that a settlement may be made of the pending actions, or failing that, that my report to you may be one that can, in the light of all the decisions of the courts, be sustained by me in any matters which it may be necessary to litigate."

George C. Earl, general superintendent of the Sewerage & Water Board, has submitted a report to Commissioner Paul Maloney, in which he recommends acquisition by the city of the street railway, electric and gas properties outright at the lowest value the courts will sustain. His report read:

Every effort I have made to formulate an adequately safeguarded privately-owned utility franchise which would induce capital to undertake to maintain a utility service, is either so unattractive to private capital, or so obviously an unnecessary burden upon the taxpayers that I have ceased to believe that a mutually acceptable and adequately safeguarded franchise is possible.

Figures given out by the New Orleans Railway & Light Company, showing its earnings, appear to bear out Mr. Ballard's estimate of the value of the company and its co-related interests, and the possibility of an 8 per cent return on a valuation of \$44,700,000, with a 7-cent fare.

## \$43,341 Deficit in Toledo in July

At the regular monthly meeting of the board of control at Toledo, Ohio, it was shown that the monthly deficit of the Community Traction Company, operating under service-at-cost, had been decreased by \$9,621, as compared with the previous month, although receipts still show a tendency to decline each month. There was not a quorum of the board of control present at the meeting so all business was held over until Aug. 22. The report, however, was published.

The net result of July operation after payment of operating expenses and credits to the various funds shows a deficit of \$43,341. The gross income from all sources was \$274,185, a decrease of \$2,488 over the previous month. This decrease was less than that noted from month to month. The passenger revenue shows a decrease of \$5,321, while revenue from other sources increased. The charge to maintenance and repairs, due to extensive summer work, increased in July by \$8,877. Car mileage for the month increased 22,607 miles.

The city lines reflected a reduction in car mileage of 168 car miles while the Toledo Beach line increased the daily average by 205 car miles. During July every line in the city showed a daily loss running from \$3 to \$137 and the net decrease in riding per day throughout the system amounts to \$437.

The commissioner has accumulated a surplus of \$79,011 in the maintenance and repair fund and throughout the rest of the year will cut down the monthly credit to this fund so as to leave a reserve of \$5,000 by Feb. 1.

The depreciation fund shows \$56,666 on hand. There was credited to it during the month \$10,625. The whole balance represents cash with the exception of \$21,250. The sinking fund, which represents the city's ownership in the property, received a cash payment this month of \$17,708, its full allotment for the first time since the ordinance has been in operation. This fund now is at the \$106,249 level. Cash credits to the injuries and damages and tax reserves were made, giving each fund a surplus.

## Financial Relief Absolutely Necessary

Whether Manistee, Mich., will continue to have electric railway service will depend upon the decision of the State Public Utilities Commission. Recently the City Council denied the petition of the Manistee Railway for permission to abandon service, but recommended that the company seek relief from the State Public Utilities Commission.

Manager Kressler declared that his company is in real distress financially. He expressed a desire to turn over the lines to the city to operate or to permit the city to dispose of the franchise. The number of passengers carried during June was given as 13,998. The daily receipts range from \$28 to \$30.

### Havana Income Increased

Net of the Havana Electric Railway & Light Company Increased Nearly 14 Per Cent

According to the annual report of the Havana Electric Railway Light & Power Company, Havana, Cuba, for the year ended Dec. 31, 1920, the electric railway department contributed 44.2 per cent of the gross earnings from operations, and omnibuses only 0.4 per cent. The balance was from the sale of electricity and gas. The report states that the gain in gross earnings from operation of the entire property were 22.14 per cent greater than in 1919; the total operating expenses 32.9 per cent greater; the total net earnings from operation 11.9 per cent greater, and after deducting United States and Cuban taxes the gain was 13.8 per cent.

#### RAILWAY CONTRIBUTES LESS TO INCOME

The relative standing of the railway department has declined seriously. In 1914 it contributed 54.6 per cent of the total net earnings of the company, while in 1919 it gave 40.6 per cent and in 1920 only 30.2 per cent. The marked decrease in 1920 was due mainly to the increase in wages, which form a much larger proportion of the total operating expenses than in the others and for which there has not been time to institute any compensating economies. The loss of earnings during the strike in August also contributed. For several years past the railway has needed cars faster than it was possible to supply them, hence it has lagged somewhat behind the others in the development of possible business.

In connection with this comparison railway operation has materially improved in efficiency, the power used has increased 23 per cent since 1914, while the passenger car miles operated has increased 26.8 per cent and the

traffic handled 73.6 per cent. The increase of passengers relative to car miles is too large, which indicates that this service has fallen behind and needs to be extended. Plans for an improved passenger car are now being worked out, and it is expected to increase the capacity, cut down the dead weight, and decrease the time required for building.

An analysis of the statistics as to railway operation shows an increase of 17.5 per cent in the earnings per car mile. This was due entirely to the heavier loading of cars. Even with the new cars added to the service in November and December, the number of passengers per car mile was not reduced and there is no doubt but that an immediate large increase in the number of cars would prove profitable.

### Receivership May Be Lifted

Amicable settlement of the financial affairs of the Memphis (Tenn.) Street Railway is reported to be in a final stage of completion. The actual return of the property to former officials and management of the railway may be deferred for some time owing to the problems which enter into relinquishing the lines, but a public announcement of a settlement is expected this month.

Whether the problem of an increased fare entered into the negotiations between the creditors and the management has not been disclosed. Negotiations between New York capitalists holding paper of the railway and the former management have been in progress for some time and a compromise has been considered from varied angles. There has been much speculation as to the conditions of the proposed reorganization, but nothing definite has been divulged which would tend to disclose upon what terms the various creditors will participate in the reorganization.

### Successor Company at Savannah Chartered

The Savannah Electric & Power Company, Savannah, Ga., has been incorporated to take over after foreclosure and sale the Stone & Webster properties in Chatham County. The new company will have a capital stock of \$4,800,000 to be divided into shares of \$100 each, of which \$1,300,000 will be first preferred stock, \$1,000,000 preferred stock and \$2,500,000 common stock. The first preferred will be known as debenture stock and entitled to cumulative dividends at the rate of 8 per cent a year, the preferred stock at the rate of 6 per cent. The three classes of stock will have equal voting power.

The incorporators named in the petition are A. A. Lawrence, E. H. Abrahams, Paul Fusillo, John J. Bouhan, Alvah Herzog, H. Mercer Jordan, Lewis A. Mills, Jr., Thomas F. Kearns, W. H. Bedgood and Robert L. Colding.

While no announcement to that effect has been authorized it is generally understood that the formation of the consolidated company foreshadows an application to the United States Court for discharge of the receivership which has continued for more than a year. The reorganization plan was submitted to the stockholders some time ago by a committee, and the formal application for a charter for the new concern indicates that the stockholders have approved the plan. No immediate changes in the policies of the company are said to be contemplated as a result of the reorganization.

The plan for the reorganization was reviewed briefly in the issue of the ELECTRIC RAILWAY JOURNAL for July 30, page 182.

### Receiver's Certificates in Default —Foreclosure Ordered

The property of the Second Avenue Railroad, New York, N. Y., has been ordered sold by the Supreme Court on Sept. 1 in foreclosure proceedings. The sale is the result of judgment obtained for default on principal and interest on \$3,140,000 of receiver's certificates. The suit was instituted by the protective committee representing the holders of the receiver's certificate. In addition to the back interest now due, there are back taxes, water charges and other claims of approximately \$290,000. The property includes approximately 23 miles of track and a carhouse. The block on which the carhouse is situated comprises fifty-two city building lots. It is assessed at \$1,395,000, of which \$590,000 is said to represent the value of the land.

**Electric Lines Improve in 1920.**—According to figures recently published by the Wisconsin Railroad Commission electric railways and interurbans operating in that state carried 177,795,571 passengers in 1920 against 161,995,506 in 1919. Total earnings increased from \$11,222,239 in 1919 to \$14,698,638 in 1920.

STATISTICS OF HAVANA ELECTRIC RAILWAY & LIGHT COMPANY AS TO TRANSPORT OPERATIONS

Revenues:	1920	1919	Per Cent. Change
Passenger revenue.....	\$4,850,969	\$4,185,488	15.8
Other car earnings.....	135,860	177,610	23.55
Miscellaneous earnings.....	92,905	.....	.....
Stage earnings (animal).....	(a)	58,409	.....
Omnibus earnings.....	46,950	63,742	26.30
<b>Total operating revenue.....</b>	<b>\$5,126,685</b>	<b>\$4,485,249</b>	<b>14.2</b>
<b>Operating expenses:</b>			
Maintenance.....	\$653,499	\$454,336	43.8
Depreciation reserve.....	381,397	228,845	66.2
Transportation.....	2,505,108	1,745,569	43.5
General.....	295,450	229,397	29.0
Stage expenses (animal).....	(a)	61,540	.....
Omnibuses.....	41,511	50,925	18.5
<b>Total.....</b>	<b>\$3,876,965</b>	<b>\$2,770,612</b>	<b>39.8</b>
Net earnings from operation.....	\$1,249,720	\$1,714,637	27.1
Taxes.....	101,950	108,200	5.7
<b>Gross income.....</b>	<b>\$1,147,770</b>	<b>\$1,606,437</b>	<b>28.8</b>
<b>Deductions:</b>			
Interest.....	557,214	567,261	17.7
Trigo annuities.....	3,368	3,345	0.7
<b>Total deductions.....</b>	<b>\$560,582</b>	<b>\$570,606</b>	<b>17.6</b>
<b>Net income to profit and loss.....</b>	<b>\$587,188</b>	<b>1,035,831</b>	<b>43.3</b>
<b>Traffic handled:</b>			
Passengers carried.....	97,019,389	83,709,762	15.9
Passenger car miles.....	13,668,249	13,507,527	1.2
<b>Car mile statistics:</b>			
Passenger earnings (cents).....	35.49	30.98	14.5
Operating expenses (cents).....	25.27	17.98	40.5
Passengers carried.....	7.12	6.21	14.62

Difference. (a) Sold July, 1919. Italics indicate decrease.



### Merger Enabling Legislation Approved

Legislation which will have an important bearing on the electric railway situation in the capital, has been agreed upon by the District of Columbia committee of the House of Representatives. The measure is known as the Woods bill and provides authorization for a merger of the Capital Traction Company and the Washington Railway & Electric Company. It also authorizes a merger of the combined companies with the Potomac Electric Power Company, but precludes any merging of the Washington Railway & Electric Railway Company with the power company.

The bill relieves the railways of the obligation of paying the salaries of crossing policemen, but it levies a tax of 50 per cent on all earnings above 7 per cent of each railway. The gross earnings tax is reduced from 2 to 1 per cent.

In case of a consolidation of the railway with the power company, separate accounts must be kept of income from railway operations and from the sale of power. The Public Service Commission is authorized to pass upon the reasonableness of all expenditures of the railway.

The bill further provides that unless a merger is effected by July 1, 1922, the Public Utilities Commission may establish two rates of fare on the lines of the two companies.

### Strike Loss \$1,564,124 in Six Months

During the first six months of 1921 the United Traction Company, Albany, N. Y., suffered a loss of \$1,564,124 and a decrease of 18,544,974 passengers carried, according to the report which the railway has filed with the Public Service Commission. Five of the months covered are included in the strike period. The report itself says: decrease between 1921 and 1920 due to strike which started Jan. 29, 1921. Normal conditions have not yet been reached on the lines of this company.

In short, the cost of operating the lines of the United Traction System during the strike period was considerably more than during the corresponding period of last year when normal conditions prevailed.

During the first six months of this year the company carried 4,504,418 whereas in the first six months of 1920 the number of passengers carried was 23,049,392, the loss this year being 18,544,974. During the six months of 1921, one month—January—witnessed operation under normal conditions.

During April, May and June of the current year the passenger revenue was \$60,745, while during the same months of 1920 it had been \$805,152, thus showing a loss for the quarter this year of \$744,406.

Notwithstanding the small income the operating expenses for the quarter were \$720,705, as compared with \$689,592 in the like quarter of 1920, or

an increase of \$31,112. The "conducting transportation expense" increased from \$347,742 in the quarter of 1920 to \$458,712 in the quarter of 1921. This same account shows an increase of \$377,419 for the half year. General and miscellaneous expenses rose from \$98,587 to \$117,058. The net loss for the quarter after deducting all interest charges, was \$809,393.

The passenger revenue during the first six months of 1921 was \$313,491, and during the corresponding months of last year it was \$1,564,958. This year the net loss for the first half of the year was \$1,564,124, and during the first six months of 1920 there was a loss of only \$102,720.

### Debentures Retired by Texas Electric Railway

The Texas Electric Railway of Dallas, Tex., has filed an amendment to its charter increasing its capital stock from \$10,500,000 to \$12,660,000, to provide for the issue of \$2,160,000 of first preferred stock to retire debentures of that amount. The amendment was filed in the office of the Secretary of State at Austin by Jack Beall, president of the company.

Mr. Beall explained that the increase in capital is not being made with a view to providing capital for improvements or betterments of any kind, but is merely to carry out an agreement made at the time of the consolidation of the Texas Traction Company and the Southern Traction Company on Jan. 1, 1917, under the name of the Texas Electric Railway. At that time a written agreement was entered into that \$2,160,000 in debentures would be taken up by an issue of first preferred stock at the end of five years. Most of the new stock issue holders are residents of Dallas and towns along the line of the Texas Electric Railway.

### Transfer of Toronto Railway to City Delayed

Hope has been abandoned of the City of Toronto, Ont., taking over the property of the Toronto Railway on Sept. 1. The arbitration proceedings under which the city will acquire certain of the property of the company prior to its transference to the Toronto Transportation Commission will not be completed until after that date. Partly in consequence of this state of affairs the annual general and the special meetings of the stockholders of the Toronto Railway, fixed originally for Aug. 19, have been postponed to Sept. 30.

In a statement to shareholders, Sir William Mackenzie, president of the railway, said:

Every effort has been made by your directors to hasten the negotiations for the sale of the company's power and radial interests. The most important questions have now been settled in principle, and the draft agreement submitted by our solicitors to the Hydro Commission has at last been returned with amendments which are now being discussed between our own and the commission's solicitors.

There remain for settlement certain questions in the working-out of the transaction which possess considerable importance, and it will not be possible to have the agreement finally settled and a statement of the

effect of it prepared and sent to the shareholders by Aug. 19, which renders a further adjournment essential.

While the delays which have taken place are regrettable it is now felt by your directors that very substantial progress has been made and that the main difficulties have been surmounted. It is confidently hoped that no adjournment beyond the one now indicated will be necessary, but should such be you will be notified at least one week before the date of meeting.

On Sept. 1, when the commission was due to take over the lines, the traffic is at its heaviest on account of the Canadian National Exhibition then being held, and it is, therefore, not proposed to introduce any new routing immediately. In addition certain physical alterations and connections must be made before new cars can be run, or before the lines formerly owned by the city and those of the railway can be connected. These alterations and connections cannot be made till after Sept. 1.

## Financial News Notes

**Deficit Piling Up in Findlay.**—A deficit of \$2,036 during July in the operation of the Findlay, Ohio, city lines under service at cost was reported by the Street Railway Commission. The seasonal decline in traffic was advanced as the reason for the drop in returns. The stabilization fund has dropped from \$20,000 to \$13,001 as a result of monthly deficits since March. For betterment the company has expended \$4,200. Fares are now 10 cents cash, seven tickets for 50 cents or two for 15 cents. The cash fare was 8 cents when the new plan was put into operation.

**Plane at Cincinnati Abandoned.**—The Fairview incline plane at Cincinnati, Ohio, has been shut down permanently. Bert L. Baldwin, an engineer who examined the plane, reported recently that the structure was beyond repair and that if that mode of transportation was to be continued the plane would have to be rebuilt entirely. To do that, Mr. Baldwin estimated, would cost the Cincinnati Traction Company approximately \$55,000. In view of the cost of replacing the incline and of the fact that it still would continue to be a hazard traction officials agreed to abandon the structure.

**Decrease in "Saltair" Income.**—The Salt Lake, Garfield & Western Railroad, Salt Lake City, Utah, known as the "Saltair Road," in its annual report for 1920, made to the State Utilities Commission, shows an increase in operating expenses of \$21,563 over 1919, and a decrease in income of \$42,042 compared with the preceding year. The total railway operating revenue for the year was \$188,044, an increase of \$35,835 over the year 1919. The net revenue from the Saltair beach properties, owned by the railroad, was \$15,755, a decrease of \$13,685 from the net revenue of the preceding year.

## Traffic and Transportation

### One-Man Cars Saved Tampa

Manager There Summarizes Lessons of Three Years' Experience With "Katydids"

One-man cars are the biggest factor in maintaining a 5-cent fare in Tampa, Fla., according to T. J. Hanlon, general manager of the Tampa Electric Company, which operates Birney one-man cars on practically every division. The cars, nicknamed Katydids by the Tampa *Tribune*, are proving time savers and nickel gatherers.

"We get many a nickel that we wouldn't," is the opinion of Peter O. Knight, vice-president and general counsel for the company, and the Stone & Webster supervising director for all their Florida properties. He says that the one-man car enables a seven-minute schedule where a fifteen minute schedule was in vogue before, and that the fellows who used to be picked up by passing friends in autos generally find a street car passing before the auto does, and hop aboard.

Mr. Hanlon and Mr. Knight agree that the spirit of fairness which the citizens and their officials have always shown toward the company at Tampa is a factor also in maintaining a lower rate.

Questioned by the correspondent of the *ELECTRIC RAILWAY JOURNAL* at Tampa as to the reasons why the Tampa Electric Company has been able to continue the 5-cent fare Mr. Hanlon stated that there were several allied reasons for the low fare in Tampa. Among these he declared were the spirit of co-operation existing between the county and city authorities and the company; the division of overhead charges between the lighting and railway department and the introduction of the Birney car.

In speaking of the latter, Mr. Hanlon said:

I am told that there was considerable comment when the Birney cars first appeared on the streets of Tampa. They were such a complete departure from the open type so long used in this city. Of course, like any other new thing, the only real test is what experience shows. It was not long before the public found that the Birney cars made faster time and came more frequently than the two-man cars they had replaced. This caused the people to patronize the Birney cars more than they had the other cars. This verdict was rendered in the increased number of fares collected, in a way which was unmistakable.

The way the Birney cars appealed to our men was, of course, of importance to us. The matter has worked out to the complete satisfaction of the trainmen. No one ever lost his job due to the Birney cars, because they were introduced gradually and, as a matter of fact, as many men are now employed as when these cars were first introduced. Then again we have put in service more of the Birneys than the number of two-man cars replaced. In addition to the above, we pay the Birney car operator 10 per cent more than other trainmen.

When asked about the effect of the Birney cars on the accident situation,

Mr. Hanlon consulted his records. Apparently for the last calendar year the Birney cars in Tampa ran 1,666,135 miles and the two-man cars 1,326,402 miles. The Birneys in that period had 734 accidents, the two-men cars 755 accidents. Hence each Birney ran 2,239 miles before it had an accident, and each two-man car only ran 1,757 miles before it had an accident. Over 27 per cent more miles per accident for the Birneys. Mr. Hanlon said:

The question you have asked is one that came up continually when the Birney car was introduced in Tampa. We have been operating the Birneys for three and one-half years, so that our statistical record of accidents as between one-man and two-man cars is based on a great deal of experience.

Many people when they see figures like those, think them paradoxical. They think taking one trainman off a car makes its operation more hazardous. On the contrary, the figures showing one-man operation, based on the record of millions of car miles, to be safer than two-man operation, are just what we ought to expect.

Lots of people said that one man couldn't do two men's work. Well, it doesn't work out that way at all. Our men prefer the Birney cars to run on, because they find the work so much more interesting, entirely aside from the 10 per cent extra pay, which helps of course.

To the public the Birney car means more service, quicker service and safer service. To the trainmen it means more interesting and better paid work. To the company it means more economical operation and that in the end helps the public through lower fares. Without these cars the fare would be 7 or 8 cents.

Questioned as to why the economy to the public and company and increased pay to trainmen couldn't be applied to the big cars as well as to the little ones, Mr. Hanlon said:

That matter is already under consideration. Of course we will first equip the big cars with the same safety devices as the Birney cars have before entrusting them to one man to operate. The results so far have been satisfactory to the public and company and we hope to continue the development of one-man safety operation.

### Trailers Dropped Except During Rush Hours

On account of the loss of traffic owing to jitney and motor bus competition, the Detroit (Mich.) United Railway has revised its car schedule on the Jefferson Avenue line. The interval of time between cars has been decreased and trailers have been dropped except during the rush hours of the day.

While industrial travel has been materially decreased for some time as compared with last year's traffic, due to the reduction in forces at some of the factories, this condition is gradually improving. With the Ford plant in Highland Park running with a record output, but with a decrease in workmen, and other auto plants increasing their forces, industrial traffic is increasing.

While no figures are given out by the Detroit United Railway as to the loss in traffic due to jitney competition, the changes in schedules were made in an endeavor to regain some of the lost revenue and the results have been fav-

orable. The number of jitneys in the city of Detroit has decreased owing to a recent Council ordinance requiring each jitney driver to provide a bond for \$1,000.

### Alton Jitneys Restrained

Public Autos There Required to Suspend by Court—Must Now Secure Proper Certificates

Under the Illinois Commerce Commission law, which holds that a transportation line must be able to certify that it is both a necessity and a convenience, the United States District Court in East St. Louis has put the jitney buses out of business at Alton, Ill. This was accomplished on Aug. 17 when Federal Judge English made permanent a temporary injunction granted in July at the request of the receivers of the Alton, Granite City & St. Louis Railway restraining the several jitney men defendants from operating the buses. The buses threatened by their competition to hurt the railway to an extent that might require it to suspend.

The contention of the defense that interstate transportation was not involved was overruled, the railway being in the hands of receivers. It is now intimated that the bus operators may apply to the Illinois Commerce Commission for permits, but in the meantime the buses have been withdrawn from service.

#### RECEIVERS RESORT TO COURT

To the informal representations of W. H. Sawyer and Fred E. Allen, the railway receivers, little attention was paid by the Alton city officials when it appeared that unless something was done to curb the unfair jitney operation the railway must cease business. The receivers had been laying new track and repaving part of the streets in Alton, but the jitneys continued to roll over the new pavement and when it became evident the city officials would take no action, the matter was taken into the Federal court.

The jitneys were not operated by transportation companies and had no authority from the Illinois Commerce Commission. The railway fare is 8 cents. The jitneys were charging a nickel. They took the cream of the short haul traffic. They did not operate at all hours. They left the traffic of the dull periods for the railway. These are merely some of their sins.

As soon as the buses quit, the revenue of the street cars in Alton showed a decided gain. It is still too early, however, to indicate just how much average increase in fares will result from the stopping of unfair competition. Mr. Sawyer says he hopes the passing of the jitneys will put the railway in a position to carry out its improvement plans and operate successfully. If the jitney men go before the Illinois Commerce Commission they can be compelled to pay taxes as transportation companies and be forced to obtain permits, which may take much time.

## Jersey Hearing Postponed

Argument on Appeal of Public Service Railway to Ignore Commission Ruling Put Over to Sept. 13

Judges Rellstab and Davis, sitting together in the United States District Court at Trenton, N. J., on Aug. 18 denied the motion made to dismiss the proceedings in the Public Service Railway fare case and the motion to include as defendants in the suit the municipalities served by the railway. Later the judges modified this order to the extent of recognizing the cities as "friends of the court." In this way they have opened means for the participation of the cities in the conduct of the case to an extent that may make it unnecessary for the municipalities to renew their appeal to intervene as full fledged parties to the proceedings.

At the close of the session of the court on Aug. 18 it was decided to hear final argument on Sept. 13. The appeal of the railway is for an order from the court which will prevent interference with the company collecting a 10-cent fare. The Board of Public Utility Commissioners recently decided that a 7-cent fare with a 2-cent transfer charge should be established in place of the then existing 7-cent fare with a charge of 1 cent for each transfer.

Most of the session on Aug. 18 was given over to argument of L. Edward Herrmann, counsel for the Public Utilities Commission, who contended that the Public Service was not attacking the constitutionality of the state utility law, therefore could not appeal under Section 266 of the federal judiciary act.

This was admitted by Robert H. McCarter for the company. He then pointed out to the court that Section 266 as amended in 1913 provided that this statutory court could issue an injunction restraining enforcement or execution "of any order made by an administrator or commission acting under and pursuant to the statute of such state."

The court said it had no authority to act then inasmuch as the statute required three judges to sit. Judge Rellstab said, however, that he would deny the motion, reserving the right for Mr. Herrmann to appeal to the full court when it convenes Sept. 13.

## Interurban Seeks to Restrain Autos

Judge Cross of the Ottawa County Circuit Court, sitting at Grand Haven, Mich., on Aug. 6, refused to issue a temporary injunction restraining motor buses and motor freight vehicles in competition with Grand Rapids, Grand Haven & Muskegon Railway from operating until the suit brought by interurban against operators of bus lines could be tried. Judge Cross' decision permits stage lines to operate until the case can be tried in Circuit Court on its merits.

The bill of complaint filed by the railway alleged that the defendant motor lines were operating in defiance of the laws of the State regulating the operation of stage coaches over the high-

ways; that the operators of the motor vehicles named do not hold franchises from the cities and villages through which they pass, as required by the stage coach law, and that certain of the operators have failed to comply with provisions of the law.

The bill states that the Grand Rapids, Grand Haven & Muskegon Railway's earnings have been greatly decreased and that the investment in the railway is jeopardized by the unfair and unregulated competition of the autos.

## Increased Service Offered If Jitneys Are Regulated

The Indiana Union Traction Company has submitted to the City Council of Muncie, Ind., a proposal to give Muncie a service with cars as frequently as seven minutes apart, and not farther apart than twelve minutes, in place of the present fifteen and twenty-minute service. The company asks in return the enactment of an ordinance forbidding jitneys to operate in the streets occupied by the railway and giving the company permission to construct a line in Madison Street from Kiby Avenue to Fifth Street, this being an extension of the Heekin park line, for the purpose of making two loops in the eastern and southern part of town. Under the ordinance suggested there would be nothing to prevent jitneys from operating in the territory served by the railway as long as the automobiles do not use the streets in which the railway operates.

## Fare Case at Birmingham Appealed by City

Formal notice of appeal from the decision of the Alabama Public Service Commission granting an 8-cent fare with a 2-cent transfer charge has been filed by the city of Birmingham with the Public Service Commission.

Under the public utilities act, adopted by the last Alabama Legislature, all appeals from decisions of the Alabama Public Service Commission must be made to the Circuit Court of Montgomery County. Appeal may then be taken from that court to the Supreme Court.

Records of the hearing of the application of Lee C. Bradley, receiver for the Birmingham Railway, Light & Power Company, which resulted in the granting of the increased fares, will be certified to the Circuit Court of Montgomery. The case will be set in regular order before the judge sitting in the Chancery division.

City officials state that the validity of the Public Utilities bill, giving the Alabama Public Service Commission exclusive right to regulate fares charged by public utilities of the state, will be attacked by separate proceedings, which they say will be filed in court in a short time.

A ticket provision of the order of the Public Service Commission, by which the railway sells fifteen tickets for \$1, is proving popular in Birmingham. The tickets are being used very extensively by regular patrons of the system.

## Straight Fare in Memphis

Memphis Goes to Seven Cents With No Ticket Sales—Riding Still Falling Off—Wages Cut

Passengers on the cars of the Memphis (Tenn.) Street Railway were greeted on Aug. 19 with the announcement that the sale of ten tickets for 65 cents had been discontinued that thereafter a straight 7-cent fare would apply. Tickets already purchased will be received as fare during the month and after Sept. 1 they will be redeemed at the purchase price.

One year and one day before, the fare had been advanced from 6 cents straight to 7 cents, with ten tickets for 65 cents. The average fare per passenger received under the plan that has now been discontinued was 6.9 cents, so that the elimination of the sale of tickets will, if traffic holds up, add but little to the revenues of the company. Traffic during August has been at the lowest point reached during the year. If traffic conditions improve the receivers are hopeful another advance may be avoided, but if conditions do not change for the better an advance in fare to 8 cents cash, with ten tickets for 70 cents, is in prospect. Two months must elapse, however, before another change in the rate can be requested.

## 20,000 FEWER PASSENGERS IN JULY

The increase in fare was not altogether unheralded in advance, for officials of the railway had recently referred inquiries about the fare prospects to the record in the recent wage arbitration and to further declines in gross revenue during July. Operations for July in Memphis added \$20,559 to the deficit in the fare index fund, as compared with \$15,056 for June. The company carried 20,345 fewer passengers in the thirty-one days of July than it did in the thirty days of June. The total deficit to date from Aug. 1, 1919, is \$200,318.

The receivers admit that they were much disappointed at the recent wage award, which resulted in a cut of 4 cents an hour in the pay of trainmen. The receivers asked a reduction of 12 cents an hour. Based on July's business, the cut of 4 cents an hour would have saved the company about \$4,800, while the cut of 12 cents asked by the management would have saved about \$15,000.

In his testimony before the wage arbitration board, T. H. Tutwiler, receiver for the company, stated that the receivers for the company refrained from increasing the fare on July 1 because they expected a substantial reduction in wages, in keeping with the reduced cost of living.

The order under which the receivers are operating provides that: In the emergency that the fare index fund continues to decrease for two succeeding months after an increase in the rate of fare, then the commission may announce an emergency change in the rate of fare and put into effect the next indicated rate of fare forthwith.

## New Bus Routes Authorized in Washington

Extension of the Washington (D. C.) Rapid Transit motor bus service over four new routes has been authorized by the Public Utilities Commission. The commission took its action at the request of the bus company. In its petition to create the new routes, the bus company stated that "after five months of practical experience we have accumulated figures which, in our opinion, warrant additional bus lines in this city." In extending the bus lines, the commission also allowed an increase in the number of passengers the machine can carry to thirty-two—twenty-one seated and eleven standing. The transit company asked the commission to increase the number of passengers to thirty-five, but the commission ruled that such an increase would overload the machines.

## Bus Company Enlarges Operation

The Selectmen of Saugus, Mass., have granted to the Lynnfield Community Bus Company, Inc., a license to operate in North Saugus through Spring Street or Walnut Street to the Lynnfield lines. This license was granted at the behest of the North Saugus Improvement Club, which requested that the Lynnfield bus be allowed to run in opposition to the motor bus service started on Aug. 1 by the Eastern Massachusetts Street Railway, which has since been taken off, from the terminal of the car line at the Lynn city limits to Corbett's Square, North Saugus.

The motor bus line of the railway did not prove popular with the North Saugus residents. They have preferred to walk a distance and pay a higher fare to ride on the Lynnfield Community bus rather than patronize the motor bus operated by the railway.

This bus line covers a part of the territory once served by the trolley line from Lynn to Wakefield. The trolley abandoned operation some time ago.

## Detroit Bus Company Builds Own Garage

A new garage for the Detroit Motor Bus Company is being rapidly pushed to completion. The building is located at the foot of Terminal street. It will be 120 ft. x 140 ft. in dimensions, one story high. The materials being used in erecting it are brick and steel. The estimated cost is \$75,000.

W. S. Evans, president of the Detroit Motor Bus Company, announces that seventy buses will soon be in operation in response to the wide demand for the opening of additional routes in various sections of Detroit. The service furnished by the company has become remarkably popular, so much so that crowds around some of the stations become so dense at times during the evening hours that it is altogether impossible to accommodate the waiting passengers. Practically every part of the three routes now being traversed by the

buses follows street car lines but future plans provide for a network of bus lines covering the residential sections.

## 900 Buses Dispatched a Day from Seattle Terminal

The Motor Transportation Service Company, Railway Exchange Building, Seattle, Wash., announces that the conversion of the old fire station at Third Avenue and Pine Street into a motor bus terminal will be completed in about thirty days. New loading and unloading platforms will be provided. When completed, the station will be the terminus for every motor bus concern operating from Seattle. About 900 motor buses will enter and leave the station in a twenty-four-hour day. G. R. Sumpter is president of the company.

## Key Route Gets Permission to Operate Motor Buses

An ordinance has recently been passed by the city of Oakland, Cal., permitting the San Francisco-Oakland Terminal Railway to extend its service on the West Sixteenth Street and Piedmont Avenue lines by using the motor bus. Passage of the ordinance by the City Council was necessary inasmuch as a previous ordinance restricted the operation of jitney buses. The operation of motor buses under the present regulation extends transportation service from the termination of the existing electric railway lines.

## Motor Companies Slow to Comply With Law

The Graham law, which classifies inter-city motor bus lines as public utilities and makes them subject to regulation of the Public Utilities Commission of Ohio, is being complied with only half-heartedly. As a result the commission is about to begin an investigation to ascertain why so few of the 500 or more bus lines operating in the State have filed tariffs. At the time the law went into effect on Aug. 15 only six lines had filed their tariffs and only two of these conformed to regulations. A fine of \$1,000 a day is provided for negligence in filing tariffs.

The commission has drafted a set of rules for the bus lines which makes it mandatory for them to file time tables, maintain established routes, run on regular schedules, etc. Annual reports covering financial and operating transactions are required to be made.

## Bus Service Out of Columbus

The Ohio Motor Bus Company, now operating a bus line between Columbus and Westerville, started a new line from High and Broad Streets, Columbus, to Bexley on Aug. 1. The buses operate from 6 a. m. until midnight, but it is planned to establish an "owl" service. The fare is 5 cents to Franklin Park and 10 cents to Bexley. An 8-minute schedule is operated during the rush hours.

## Trolley Freight Between Camden and Trenton

The Public Service Railway will establish freight service between Trenton and Camden, N. J., beginning Sept. 1. The rates have not yet been announced. Stations will also be established at Palmyra, Riverside, Beverly, Burlington, Florence, Roebing and Bordentown. There will also be "curb stone" stops at Delair, Cambridge, Plaza Park and Fieldsboro. Proprietors of garages near these stops will be made special agents. Provisions will be made for persons to have freight picked up at places along the line which are not designated as freight stops.



**Trackless Trolley Demonstrated in Norfolk.**—The trackless trolley, which has been in use on the lines of the Virginia Railway and Power Company in Richmond, Va., has been moved by the company to Norfolk, Va., where the value of the vehicle is being demonstrated to the public.

**Ticket Fares Cut by Suburban Line.**—The board of directors of the Homestead & Mifflin Street Railway, Homestead, Pa., has ordered a reduction in the cost of ticket fares. Strip tickets which now sell at fourteen for \$1 will sell at sixteen for \$1. Cash fares will remain at 8 cents.

**Temporary Rates Extended.**—Temporary rates of the Fargo-Moorhead Street Railway, Fargo, N. D., have been extended to Sept. 3. This is pending a decision in the case, through an order issued by the State Railroad Commission and officially announced in its last bulletin. The rate is 7 cents.

**Fares Advanced to Ten Cents.**—The Public Service Commission has given permission to the Alabama Power Company to charge 10 cents on its lines in Huntsville. The company was operating on a 7-cent fare granted last year and proved that this rate produced a very small increase in revenue.

**Jitneys Barred from Railway Streets.**—The City Council of Aberdeen, Wash., recently passed an ordinance barring jitneys from all streets served by lines of the Grays Harbor Railway & Light Company. Jitney interests have secured legal representation, and it is stated the matter will be carried by them to the courts.

**\$10,000 Addition a Month Expected.**—The increase in ticket fare at Toledo, Ohio, from eight for 50 cents to six for 40 cents, which went into effect on Aug. 20, is expected to yield about \$10,000 a month additional revenue. Officials of the Community Traction Company believe that by next spring fares will begin to return step by step back to a nickel fare.

**Rerouting to Expedite Traffic.**—The City Council of Indianapolis recently accepted three proposals for rerouting interurban cars and West Washington Street cars. The recommendations were put into effect on June 26. Interurban routes have been changed so as to eliminate traffic from the already congested trunk lines on Virginia and Massachusetts Avenues.

**City Answers Fare Petition.**—In answer to the petition of the Durham (N. C.) Public Service Company before the Corporation Commission for a 10-cent fare, the city attorney has prepared a request for a reduction in fares from 8 cents to 7 cents. The city contends that an increased fare will work to the detriment of the company since there has been a notable decrease in passengers carried since the fare was advanced from 7 cents to 8 cents.

**Ten-Cent Units Desired.**—The Millville (N. J.) Traction Company has applied to the Public Utility Commission for permission to increase its rates from 7 cents to 10 cents. Last year the company abolished commutation tickets and the fare from Millville to Vineland was increased from 10 to 14 cents. The company recently took up its tracks from Millville to South Millville due to heavy losses. The hearing is scheduled for Sept. 6 at Trenton.

**Plea Made for Jitneys.**—Fifteen thousand persons, most of whom reside in the south and west sections of Indianapolis, are said to have signed a petition requesting the City Council to refrain from eliminating the jitney. The petition is being held in readiness for presentation to the Council in case the ordinance to regulate jitneys is called out of committee. The petitioner said: "We know what the street car service was prior to the introduction of the jitney and what it will be again if you permit the jitney to be abolished."

**1,300,000 Fewer Passengers a Month.**—The Cincinnati (Ohio) Traction Company has cut its service about 10 per cent because the company is handling 1,300,000 fewer passengers each month this year than during the corresponding months last year. Normally about 12,000,000 passengers are carried each month. Walter A. Draper, vice-president, in explaining the action taken by the officials of the company, said the closing of several large factories in the industrial centers was responsible for the curtailment of service.

**City Will Not Act.**—The City Commission of Hoquiam, Wash., after consideration of the drafting of an ordinance denying to jitneys the use of certain streets, as requested by the Grays Harbor Railway & Light Company, has announced that it will take no action in the matter. The commissioners state, in part: "From an examination of the ordinance submitted, it is apparent that the ordinance, if passed, would absolutely prohibit the operation of stage lines between this city and Aberdeen, as well as local jitneys. Under the form of city government here, it is possible for a petition to be filed initiating

an ordinance whereby the same may be submitted to the voters of the community for acceptance or rejection."

**Eight-Cent Zone Rate Allowed.**—The State Public Utility Commission of New Jersey has dismissed the application of the New Jersey & Pennsylvania Traction Company for an increase from 7 to a 10-cent fare in each of its four zones between Trenton and Princeton, but allowed the company an increase of 1 cent for each zone, making cash fare 8 cents. The company, however, is directed to sell four tickets for 30 cents. The rate of fare within the Trenton city limits must remain at 3 cents, the company's franchise containing a clause to that effect. School children may buy commutation tickets to be used on school days at the rate of twenty-five tickets for \$1.



#### Steam Boiler Engineering

Twenty-seventh edition. Published by the Heine Safety Boiler Company, St. Louis, Mo. Cloth, 6 x 9 in., 639 pages, 400 illustrations.

Combined in this twenty-seventh edition of "Helios," which summarizes the latest commercial developments in boiler design practice, are the experience of both the technical staff of the Heine Safety Boiler Company and other eminent authorities. Covering all the phases of boiler practice from design to installation, tests and operation, it contains all the data and information of the company's long experience, to which is added sufficient theoretical explanation for clarity, so that the book is very valuable to any steam engineer.

#### Analysis of Electric Railway Problem

By Delos F. Wilcox, Ph.D., 809 pages. Published by the author. New York City.

At the conclusion of the hearings conducted in 1919 by the Federal Electric Railways Commission, the services of Dr. Wilcox were engaged by the commission to aid it in analyzing the testimony gathered and to make suggestions to the commission with reference to its report. The analysis thus prepared by Dr. Wilcox forms the greater part of the book under review. The plan followed has been to group selected parts of the testimony under appropriate chapter headings and discuss the points made. Altogether there are fifty-four chapters in the book.

Dr. Wilcox frankly says in his preface, "My analysis of the evidence presented to the Federal Electric Railways Commission confirms me in the opinion that no permanent solution of the electric railway problem, consistent with public interest, is possible except in public ownership." This viewpoint is naturally presented throughout the vol-

ume and is set forth in the fifty-four conclusions in Dr. Wilcox's summary, which forms part of the fifty-fourth chapter entitled "Public Ownership and Operation the Ultimate Solution." The author does not hesitate to admit that there are many difficulties in the establishment of even this solution. Thus, our governmental structures, in large measure, are unsuitable for the assumption of this responsibility. Railway properties extend beyond the boundary lines of municipalities and other political subdivisions. Municipal powers for incurring debts are largely exhausted. There is lack of free development of constructive policies in public administration. Nevertheless, he thinks that many of these difficulties are artificial and can be removed in time and that the proper policy now is to direct attention toward the removal of the legal, financial and administrative barriers now opposed to this objective.

From these comments the idea must not be derived that Dr. Wilcox's book is only a plea for municipal ownership and operation. It contains many interesting facts taken from the stenographic reports of the meeting and arranged under logical heads for discussion and comparison. These include statistics of the results of fare increases during 1917, 1918, and 1919, taken from a data sheet sent out by the secretary of the commission in December of the latter year, a list in tabular form of the strikes on the principal electric railway systems in the United States during 1919, giving date and duration of strike and approximate loss in revenue, a table giving wages of employees on unionized properties, etc. Six chapters are devoted primarily to different phases of the labor problem. One of these is entitled "the union labor program" and describes the plan put forth by the union officials at the hearing, and one is entitled "the right to strike," a weapon which the author thinks should be taken away, as the public's right to have local transportation service go on without interruption is paramount.

There are two appendices. One is a discussion of the local transportation issues in New Jersey in the form of a report transmitted to Governor Edwards on July 19, 1920. The other is a discussion of the Denver traction situation in the form of a report prepared for a civic commission in Denver.

On the whole railway officials will find much to interest them in the book.

#### Fare Increase Allowed in Minneapolis

The petition of the Minneapolis Street Railway, filed on June 24 and heard on Aug. 23, for a cash fare of 7 cents and four tickets for 25 cents, has been granted by the state commission, effective on Sept. 1. Further action of the city to take the matter into the courts depends on the orders of the council. The hearing of a similar request for an emergency advance in fare by the St. Paul City Railway was begun on Aug. 25.

## Personal Mention

### J. H. Sundmaker Resigns

Chief Engineer of Ohio Electric Opens Consulting Engineering Office in Cincinnati

After an absence of eight years from Cincinnati J. H. Sundmaker, widely known in the engineering world, has returned to his birthplace and is now in private practice as a consulting engineer, with offices in the Union Trust Building. During these eight years Mr. Sundmaker was chief engineer and director of all subsidiaries of the Ohio Electric Railway, with headquarters at Springfield, Ohio.

Mr. Sundmaker's resignation as chief engineer of the Ohio Electric lines was effective on July 31. G. D. Nicoll, assistant chief engineer, took over the supervision of the engineering work when Mr. Sundmaker left. It is understood that Mr. Sundmaker's place will not be filled and that Mr. Nicoll will retain his present title as assistant chief engineer.

Mr. Sundmaker has been identified with the Ohio Electric lines for the last eight years. Millions of dollars have been spent in the improvement of these lines under his direction. Mr. Sundmaker is optimistic about the future of interurbans. He believes that the Ohio Electric lines can be made to pay a good return, notwithstanding the general use of the automobile and the motor truck. As he reviews the past and looks into the future he states that he feels that the interurbans have come to stay and that no amount of competition can interfere with their successful operation if business is coaxed and expenses are reduced.

Since taking up his position as chief engineer in 1913, the year that the great flood swept that section and caused great damage to property, including that of the Ohio Electric Railway, Mr. Sundmaker has been steadily at work building up the system. Notwithstanding the present financial situation in which the roads are involved, the lines are considered in splendid shape for service. With the expenditure of a limited amount of money it is pointed out that the roads can be made to give a substantial return on the investments, after the general readjustment contemplated.

Mr. Sundmaker states that if the tracks of the Ohio Electric Railway and the other lines operating in connection are placed entirely on private right-of-way and attention paid to increasing business the interurbans can be reorganized on a paying basis. He says that every means should be adopted to move tracks from locations where expensive construction is necessitated, such as in paved streets.

Mr. Sundmaker has the honor of building the longest single span highway bridge in the United States. The new bridge was built in 1906 across the Big Miami River at Elizabethtown, Ohio. It is claimed that this is the longest single span structure of its kind ever erected. It is 600 ft. long.

On Nov. 3, 1909, announcement was made in Cincinnati that City Engineer J. H. Sundmaker had prepared a most comprehensive and important proposal for the welfare and advancement of Cincinnati, which would be submitted at the next meeting of the City Council. This contained detailed specifications for Cincinnati electric lines and a union depot scheme for steam roads.

Mr. Sundmaker has always lived in Ohio. Born in Cincinnati, he received his early education in the primary and elementary schools of that city. Along



J. H. SUNDMAKER

in 1887 he entered an engineering class conducted by Prof. William Eisele, under what was known as the "co-operative plan of working and studying at alternate periods, which is now in operation at the University of Cincinnati, the idea having been copied from Professor Eisele. Completing his education under the guidance of Professor Eisele, Mr. Sundmaker associated himself with Col. E. F. Jewett in general engineering work. Later he became engineer for Hamilton County, of which Cincinnati is a part. During the administration of Mayor Leopold Markbreit from 1908-1909 Mr. Sundmaker was city engineer of the city of Cincinnati.

When Dr. Charles Schwab was elected Mayor he appointed Mr. Sundmaker Director of Public Works, which position he held from 1910 to 1911. In 1913 Mr. Sundmaker went to Springfield and took charge of operations of the Ohio Electric Railway and its subsidiaries.

### Mr. Crowley General Storekeeper of International Railway

R. J. Crowley has been appointed general storekeeper of the International Railway, Buffalo, N. Y. Mr. Crowley joined the International Railway in 1918 as general clerk to the superintendent of equipment. At one time Mr. Crowley was in charge of furnishing material for the large construction work on the fire equipment department of the Interborough Rapid Transit Company. Previous to that he was with the Norton Company at the time of the electrification of the various street railways of New York City and also during the building of the Long Island Traction Company.

### "Bill" Goodwin Receives Loving Cup

The presentation to W. L. Goodwin of a huge silver loving cup as a token of esteem and devotion introduced a personal note into the annual outing of the Independent Associated Electrical Contractor-Dealers held at Grant City, Staten Island, on July 30. Mr. Goodwin, who is assistant to the president of the Society for Electrical Development, was the guest of honor and the presentation of the silver loving cup came as a complete surprise to him. He made acknowledgment in a characteristic speech, assuring the donors that while the spirit which prompted the gift was fully appreciated, he considers his efforts a duty and a pleasure, and entertains no thought of obligation on the part of those who enjoy the benefits.

E. F. Weber has been appointed soliciting agent of the Chicago, North Shore & Milwaukee Railroad, Highland, Ill., as a successor to L. G. Vetter.

C. M. Bange, has been appointed master mechanic of the Interstate Public Service Company, with headquarters at Scottsburg, Ind., to succeed H. H. Buckman, whose resignation was announced in these columns on Aug. 6.

Kazutada Sakurai, equipment engineer Tokyo Municipal Bureau of Electricity, Tokyo, Japan, is making a tour of the United States for the purpose of studying the electric railways. He is particularly interested in car building, car repair shops, car houses, etc.

Prof. Arthur M. Greene, of Rensselaer Polytechnic Institute, has accepted the call of the trustees of Princeton University to become dean of the engineering school and professor of mechanical engineering. He will take up his new duties in September, 1922. Prof. Greene is a graduate of the University of Pennsylvania and also holds an honorary degree of D.Sc. conferred in 1916. He has taught mechanical engineering at Drexel Institute, at the Universities of Pennsylvania and Missouri, and at Rensselaer. He has been prominent in the American Society of Mechanical Engineers as manager and vice-president and at the present time is chairman of the research committee.

C. D. Emmons has succeeded F. E. Farwell as secretary of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa. The positions of claim agent, electrical engineer and road master are now being filled respectively by R. G. Murray, S. J. Fairbanks and C. Formaker.

J. C. Hector resigned in July from the position of assistant treasurer of the Bellingham Division of the Stone & Webster interests in the Puget Sound territory. His resignation has opened the way for the advancement of C. E. Stroop, chief clerk in the office of W. E. Best, assistant treasurer of the Seattle Division, to the vacant Bellingham position. Mr. Stroop will be succeeded in the Seattle offices by W. N. Ringrose, of the Bellingham offices, who assumed his new position Aug. 1. Mr. Hector, who was among the most popular figures in the Bellingham organization, has gone to California, where he has joined a brother-in-law at Los Angeles, in the operation of a group of producing oil wells.

## Obituary

R. T. Lozier, consulting electrical engineer in New York, died Aug. 21, of pneumonia. He was 52 years old. Mr. Lozier was connected from 1883 to 1890 with the Edison interests. Later he was associated with the Allis-Chalmers Company.

W. C. Rogers, retired Cincinnati business man who, during his two terms as representative from Hamilton County to the Ohio Legislature from 1892 to 1896, fathered and put through the Rogers Bill, granting a fifty-year franchise to the Cincinnati (Ohio) Street Railway, died at Oakland, Cal. Mr. Rogers, who was seventy-five years old, was well known in Cincinnati as a theatrical producer, and a leader in the coal business. The fifty-year franchise, which Mr. Rogers was responsible for obtaining for the traction company, has been the center of discussion during the controversy that has recently been taking place between the city of Cincinnati and the company.

Epes Randolph, president of the Arizona Eastern and the Southern Pacific de Mexico, and one of the pioneer railroad men of the Southwest, died on Aug. 22. Spending his early years in the West, he was assistant engineer for various railroads in the South and Mexico from 1876 to 1885, and as engineer from that time until 1895, when he was superintendent of Southern Pacific lines in Arizona and New Mexico. From 1901 to 1904 he was vice-president and general manager of the Los Angeles Railway and Pacific Electric Railway, and held the same positions later in other railway companies until 1911, when he was appointed to the positions he held at the time of his death.

# Manufactures and the Markets

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

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## Increase in Coal Production

Current Rate Is Still a Million Tons a Week Behind the 1914 Average for Corresponding Period

For the first time in two months the production of soft coal has turned definitely upward. The output during the second week of August is estimated by the Geological Survey at 7,726,000 net tons. Not only was this an increase of 551,000 tons over the output of the week preceding, but it was the largest attained in any week since June 11, though the present rate of production is below that in other recent years. In the corresponding week of 1917 over 10,100,000 tons was produced; in 1918 the figure was 11,770,000 tons; a year ago it was 11,813,000. In 1919, a dull year for the coal trade, the corresponding week showed 9,100,000 tons. Even in 1914, a year of business depression, the August output averaged 8,700,000 tons a week. Before the current rate of production can equal even the 1914 rate it must be increased almost another million tons a week.

Production of soft coal during the first 190 working days of the past five years, the period over which records of weekly output extend, has been as follows:

Years of activity	Years of depression
1917 . . . 337,591,000	1919 . . . 273,403,000
1918 . . . 359,409,000	1921 . . . 241,548,000
1920 . . . 320,807,000	

It will be seen that the year 1921 is in round numbers 32,000,000 tons behind 1919, 79,000,000 tons behind 1920, and about 107,000,000 tons behind the average of the war years. Compared with the average of all four years, it is 81,000,000 tons behind.

Undoubtedly the largest factor in this subnormal production is a decrease in consumption resulting from the depressed condition of industry. The latest month for which consumption data are available is May, 1921. In that month the consumption for railroad fuel was probably only 81 per cent of the 1920 average; for electric utilities, only 78 per cent; and for coke manufacture, only 38 per cent. Exports in May, 1921, were but 87 per cent of the 1920 average.

## Storage Battery Demand Mostly for Replacements

Buying of storage batteries for control and lighting of multiple-unit trains is of about normal activity, according to manufacturers' reports. There has been the usual steady but not large volume of orders from railways for replacements. This type of battery, designed to furnish the power for operating the control circuit of all multiple-

unit equipment, such as electric locomotives, subway, elevated and inter-urban trains, depends for its sales largely of course, upon the purchase of new equipment. It is stated by battery manufacturers that a large sale of new equipment is not to be expected just now, but they are looking forward optimistically to business that will accompany the purchase of electric locomotives for heavy traction work.

Prices of batteries have not changed materially since the first of the year when they took a slight drop. They have followed very closely, the trend of labor and raw material prices. The present price of lead, at present 4.4 cents, is about one-half of what it was a year ago, though prices several months ago were a fraction of a cent lower than they are now.

## Portland Cement Production Increases in July

More cement was produced in the United States in July than in June, and more cement was shipped than was produced, according to figures prepared under the direction of Ernest F. Burchar of the United States Geological Survey. Both production and shipments in July exceeded the average for July in the last five years.

The production for the first seven months of 1921 is more than 97 per cent of the quantity manufactured in the corresponding months of 1920 and more than 52 per cent of the total production in 1920; the shipments are more than 96 per cent of those for the corresponding period of 1920 and more than 52 per cent of those for the whole year 1920.

Stocks at the end of July were over 1,470,000 bbl. larger than on Dec. 31, 1920, and a little above the average for July in the five preceding years, though somewhat less than at the end of June. The production of finished Portland cement for July was 9,568,000 bbl., while the number of barrels shipped was 10,301,000.

The production of clinker (unground cement) during the seven months amounted to more than 53,000,000 bbl., and the July production exceeded 9,000,000 bbl. July stocks of clinker are reported as more than 4,300,000 bbl.

## Electric Railway Proposed for Japan

Application has been made to the government of Japan, according to *Electrical Industries*, for a charter to build a high-speed electric railway between Tokyo and Nikko, a distance of eighty miles.

## Rolling Stock

**Centralia (Ill.) Traction Company** has purchased two new safety cars built by the Cincinnati Car Company and purchased from the National Safety Car & Equipment Company, St. Louis. The Centralia & Central City Traction Company has also bought two cars of the same make from the same firm.

**The Columbus (Ga.) Railroad Company** has given out the following information on the four safety cars which were recently ordered from the St. Louis Car Company as previously mentioned:

Number of cars ordered.....	4
Date of delivery.....	Oct. 15, 1921
Builder of car body, St. Louis Car Company	
Type of car.....	Single-truck safety
Seating capacity.....	32
Weight.....	16,000 lb.
Length over all.....	28 ft. ½ in.
Truck wheelbase.....	8 ft.
Width over all.....	8 ft.
Height, rail to trolley base.....	9 ft. 9 in.
Interior trim.....	Bronze and mahogany
Roof, arch or monitor.....	Arch
Air brakes.....	Westinghouse
Armature bearings.....	Ball
Axles.....	3½ in. O.H. steel, heat treated
Car signal system.....	Faraday
Car trimmings.....	Bronze
Couplers.....	Flat steel, 1 in. x 2½ in.
Curtain fixtures.....	
Curtain Supply Company (Pantastote)	
Curtain material.....	Double-faced Pantastote
Designation signs.....	Hunter illuminated
Door operating mechanism.....	Air or hand lever
Fare boxes.....	Johnson
Fenders or wheelguards.....	H&B lifeguards
Gears and pinions.....	General Electric
Hand brakes.....	
Steel tubing with ratchet wheel	
Heater equipment.....	None
Headlights.....	Golden Glow
Journal bearings (if ball or roller).....	Roller
Lighting arresters.....	General Electric
Motors, type and number.....	GE, 258C
Registers.....	International
Sash fixtures.....	Compression springs
Seats.....	
Haywood Brothers and Wakefield Company	
Seating material.....	Wood slats
Step treads.....	Peralun, 3 in. wide
Trolley catchers or retrievers.....	
Ohio Brass Company	
Trolley base.....	Ohio Brass Company
Trucks.....	St. Louis Car Company
Ventilators.....	Utility Ventilation Company
Wheels (type and size).....	Rolled steel 16 in.

## Track and Roadway

**British Columbia Electric Railway, Vancouver, B. C.**, has completed the repaving of Government Street with regard to the relaying of the tracks. Within a short time the city will complete the laying of the asphalt.

**Los Angeles (Cal.) Railway** will start soon on the reconstruction of Spring Street from First to Seventh Streets. The work will include the installation of new ties and rails and the leveling of the roadbed. The present 72-lb., 6-in. rail will be replaced by 116 lb., 7-in. girder rail. Construction work on Maple Avenue from Washington Street to Santa Barbara will be completed shortly.

**Savannah (Ga.) Electric Company** will spend \$40,000 in extensions to the Tri-State Exposition Grounds, a distance of about 3½ miles. Work will be started as soon as the franchise is granted. It will be necessary to build double lines of tracks on West Broad Street from the present double line terminal at Thirty-ninth Street, south to Forty-fifth Street, and a single line, with turnouts, on Forty-fifth to the fair grounds, where a terminal will be made between the Morehouse and Johnson buildings, with a loop in the fair grounds.

**Alton, Granite & St. Louis Traction Company, Alton, Ill.**, is making extensive improvements in Alton. Work on track renewal is in progress on State, Third, Piassa Streets and Broadway. Other track work consists of putting in new ties, lining and resurfacing. The work is estimated at \$150,000.

**Asheville (N. C.) Power & Light Company** has been given the sum of \$10,000 by J. T. Harney to help defray improvement expenses. It was with the hope that the

West Asheville car line could be extended to Harney Heights in order to give service to the people of that section that the offer was made. The Harney brothers have sold large tracts of land in this vicinity recently.

**Southern Public Utilities Company, Charlotte, N. C.**, has completed its reconstruction and paving on Liberty Street, Winston-Salem. An additional switch was put in on this street. The car on the Liberty Street in new track construction and paving represents an investment of approximately \$40,000.

**International Railway, Buffalo, N. Y.**, will be asked by the State to give up its franchise of the old Niagara Falls interurban line unless it agrees to pay its share of the paving between the tracks. Through cars between Buffalo and Niagara Falls are now routed over the high-speed line. Only local cars use the old river road line.

**Shawnee-Tecumseh Traction Company, Shawnee, Okla.**, has begun an extensive program of reconstructing bridges and improving its lines. A new steel girder bridge will replace the wooden structure across the North Canadian River. The company also intends to purchase new equipment for both the rolling stock and track department in order to increase its service.

**Northern Cambria Street Railway, Patton, Pa.**, has agreed, it is reported, to do about five miles of construction work on the route between Carrolltown and Spanglen. The trolley route has been holding up construction on the highway, but at a recent conference the State Highway Commissioner was informed that the company would make all necessary route changes.

**Reading Transit & Light Company, Reading, Pa.**, has completed an extension whereby through express service from any point on the Reading division to the Norristown division and all parts of Philadelphia is possible. This new piece of trackage in Boyertown, Pa., was approved by the Public Service Commission. Heretofore the Reading and Norristown divisions have been separated by the Colebrookdale branch of the Philadelphia & Reading Railway.

## Power Houses, Shops and Buildings

**Charlottesville & Albemarle Railway, Charlottesville, Va.**, expects to purchase one 3,000-kw. horizontal steam turbine and two boilers.

**London & Port Stanley Railway, London, Ont.**, has completed an \$8,000 terminal improvement plan. At the town station in Port Stanley improvements will be effected by putting in a concrete foundation and remodeling the interior.

**Indiana Service Corporation, Fort Wayne, Ind.**, will spend about \$125,000 in power improvements. Very soon the ground will be broken for a new power distributing plant on Webster Street. The improvement will enable the company to secure a central distributing point for power generated at the power house on Spy Run Avenue. It is estimated that the cost of the new building alone will exceed \$25,000, while the equipment will cost \$100,000 or more. Other changes are contemplated, among them being the erection of a large carhouse and car shops on the property along Spy Run Avenue to the north and west of the present power plant.

## Recent Incorporations

**Portland-Linton (Ore.) Railway**, has been incorporated with a capital stock of \$40,000. The incorporators are J. B. Schaefer, Louis Osberg and S. F. Parr.

**Savannah Railway & Power Company, Savannah, Ga.**, has been incorporated with a capital stock of \$4,800,000. This is the successor company to the Savannah Electric Company.

**Duncan, Ardmore & Lawton Interurban Company** has filed its charter with the Secretary of State at Oklahoma City. The company is capitalized at \$10,000. The incorporators are J. W. Marshall, A. Harris and F. T. Harris. Headquarters of the company will be at Duncan, Okla. It is proposed to promote and build an interurban line from Duncan to Ardmore and Lawton.

## Trade Notes

**American Steel & Wire Company** announces the appointment of H. S. Durant as sales agent and M. W. Floto as assistant sales agent at its Detroit office, to succeed M. Whaling and T. J. Usher, Jr., resigned.

**Delta-Star Electric Company, Chicago**, has opened a direct district office at 294 Washington Street, Boston, Mass. This office is in charge of Messrs. Anderson & Van Rosen, who have for several years been connected with the Delta-Star Engineering Department at Chicago.

**The Automatic Reclosing Circuit Breaker Company, Columbus, Ohio**, announces that it has engaged the services of Ralph R. Rugheimer, who will be responsible for its activities in the coal fields of eastern Kentucky, Virginia and southeastern Ohio. Mr. Rugheimer has a thorough knowledge of the company's apparatus and has had considerable experience in its installation and operation.

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.**, it is reported, is the company which the government of Chile, South America, has decided upon to go ahead with the electrification of the state railway which runs from Valparaiso to Santiago, with a branch cutting up to Los Andes in the Andes Mountains and thence across to Buenos Aires. The Westinghouse company, however, as yet has made no statement in the matter.

**The Malcolmson Briquet Engineering Company and the St. Louis Briquette Machine Company** have consolidated under the corporate name of the Malcolmson Engineering & Machine Corporation. The company will continue to act as engineers and contractors for the building of complete plants for fuel briquetting, and for drying, crushing and screening of coal. It will also maintain an engineering department devoted to the generation and use of steam, special furnace design and other heat problems. In addition it will manufacture "Rutledge," "Komarek" and improved roll-type briquetting presses, fluxers and other special machinery and machine parts, direct and indirect heat dryers and vibrating screens. The officers of the new company are: C. T. Malcolmson, president; G. Komarek, vice-president; C. E. House, secretary, and W. J. Monahan, treasurer. The offices of the company are located in the Old Colony Building, Chicago; 818 Security Building, St. Louis, and 39 Cortlandt Street, New York City.

**John C. Robinson**, after thirty years' continuous service in Boston as manager of New England sales for William Wharton Jr. & Company has terminated that connection. He will devote himself to his interests in the firm of Harrington, Robinson & Company of that city, an organization well known in the iron and steel trade. Starting at the time he did, Mr. Robinson has seen and participated in the many changes in street railway and steam railroad transportation methods. His pleasing personality coupled with his thorough knowledge of the track business, has made him a host of friends in both fields, as well as in the Wharton Company. The office of the Taylor-Wharton Iron & Steel Company, and William Wharton Jr. & Company in the future will be located at Room 235, Boston Safe Deposit Building, 201 Devonshire Street, Boston, in charge of Walter H. Allen.

**A. J. Manson**, of the New York district office of the Westinghouse Electric and Manufacturing Company has been appointed manager of the railway division for this district.

## New Advertising Literature

**Inspection and Energy Meters.** — The Economy Electric Devices Company, Chicago, has issued a two-page folder giving particulars of results secured with Economy meters on the cars of the Eastern Massachusetts Street Railway. Besides the advantages from the standpoint of indicating the proper car inspection interval, the meters showed energy savings as high as ½ kw.-hr. per car-mile. The company has now contracted for inspection dials on meters of 700 active cars which include 251 new safety cars.